Dipole Instability of a Relativistic Electron Ring Loaded With Two Species of Ions

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Abstract

The electrostatic interaction of a relativistic electron ring with the ions contained in it leads to instability under certain conditions, as is well known. Since there are always different ion species present in the ring, the influence of the ion mixture on the instability is investigated in this paper. A dispersion equation is derived in which, besides the interaction of the electrons with one ion species, both the collective interaction of the electrons with a second ion species and the collective interaction between the two ion species are taken into account. As solutions of these equations show, no excessive enhancement or suppression of the instability nor an appreciable displacement of the region of instability due to the additional interaction takes place. For sufficiently small fractional ion loading the region of instability splits into two regions corresponding to the separate interactions of each ion species with the electrons.

The instability of an electron ring arising from its interaction with ions contained in it was treated in several papers theoretically 1)2)3) and experimentally4). In Ref. 5 the additional focussing effects which result from cylindrical structures like a "squirrel cage" inside or outside the ring were included in the theory. The present treatment extends this theory to the interaction of the electron ring with two kinds of ions. This same question was dealt with by Nikolaeva and Koshkarev 6). In their paper, however, the interaction among the ions was neglected. Their treatment is therefore valid only for small fractional ion loading. Furthermore the magnetic field effect on the ion motion is neglected there which becomes important for the radial instability when the resonance frequencies become very small.

Derivation of the dispersion equation

The equations of radial motions for the electrons and the two kinds of ions are

$$\left.\begin{aligned} \frac{1}{\omega_0^2}\ddot{r}_e &= -q_e^2 r_e + q_{e1}^2 r_1 + q_{e2}^2 r_2 \\ \frac{1}{\omega_0^2}\ddot{r}_1 &= q_{1e}^2 r_e - q_1^2 r_1 - q_{12}^2 r_2 \\ \frac{1}{\omega_0^2}\ddot{r}_2 &= q_{2e}^2 r_e - q_{21}^2 r_1 - q_2^2 r_2 \end{aligned}\right\} \quad (1)$$

where r_e, r_1 and r_2 are collective radial displacements and ω_0 is the electron revolution frequency. The q's can be written in analogy to Ref. 5:

$$\left.\begin{aligned}
q_e^2 &= 1-n+\rho\left(f_1+f_2-\frac{1}{2\alpha_E^2}+\frac{\beta^2}{2\alpha_M^2}\right)\\
q_{e1}^2 &= \rho f_1\left(1-\frac{1}{4\alpha_E^2}\right)\\
q_{e2}^2 &= \rho f_2\left(1-\frac{1}{4\alpha_E^2}\right)\\
q_1^2 &= \rho Q_{g1}\left(1-f_2-\frac{f_1}{2\alpha_E^2}\right)+Q_{g1}^2\\
q_{12}^2 &= \rho f_2 Q_{g1}\left(1-\frac{1}{4\alpha_E^2}\right)\\
q_{1e}^2 &= \rho Q_{g1}\left(1-\frac{1}{4\alpha_E^2}\right)\\
q_2^2 &= \rho Q_{g2}\left(1-f_1-\frac{f_2}{2\alpha_E^2}\right)+Q_{g2}^2\\
q_{21}^2 &= \rho f_1 Q_{g2}\left(1-\frac{1}{4\alpha_E^2}\right)\\
q_{2e}^2 &= \rho Q_{g2}\left(1-\frac{1}{4\alpha_E^2}\right)
\end{aligned}\right\}\quad (2)$$

with

$\alpha_{E,M} = (R_{E,M} - R)/\sqrt{a\,\bar{b}}$

β = electron speed/light speed

$\gamma = (1-\beta^2)^{-1/2}$

$R_{E,M}$ = radius of electric and magnetic images

n = field index = $-(R/B)\cdot(\partial B_z/\partial R)$

$Q_{g1,2} = Z_{1,2}\,\gamma\, m_e / m_{i\,1,2}$

$\rho = r_0 R N_e / (\pi\, a\, \bar{b}\, \gamma)$

$r_0 = 2.82 \cdot 10^{-15}\,\mathrm{m}$ = classical electron radius

R = major radius of the electron ring

a = radial half width of minor ring dimension

b = corresponding axial half width

$\bar{b} = (a + b)/2$

$f_{1,2} = Z_{1,2} \cdot N_{1,2} / N_e$ = fractional ion loadings

The coefficients (2) are valid only in the limit of small curvature of the ring as well as the walls . A better approximation done by I. Hofmann [7] contains also terms proportional to $\frac{1}{\alpha_E}$. We thought, however, that for our purpose the simpler coefficients (2) are good enough.

The set of equations (1) is solved as usual by the assumption

$$r_{e,1,2} \sim \exp\left[i\,(m\varphi - \omega t)\right]$$

where m ist the azimuthal mode number, the azimuthal position of the particles taken as being constant for the ions and t for the electrons so that

$$\ddot{r}_e = -\,(m\,\omega_0 - \omega)^2\, r_e$$

$$\ddot{r}_1 = -\,\omega^2 r_1$$

$$\ddot{r}_2 = -\,\omega^2 r_2$$

The equations (1) are reduced to a system of three linear homogenous equations for $r_{e,1,2}$ (with $\vartheta = \omega/\omega_0$):

$$\left.\begin{aligned} \left[q_e^2 - (m-\vartheta)^2\right] r_e - q_{e1}^2 r_1 - q_{e2}^2 r_2 &= 0 \\ - q_{1e}^2 r_e + (q_1^2 - \vartheta^2)\, r_1 + q_{12}^2 r_2 &= 0 \\ - q_{2e}^2 r_e + q_{21}^2 r_1 + (q_2^2 - \vartheta^2)\, r_2 &= 0 \end{aligned}\right\} \quad (3)$$

Equations (3) have a nonzero solution only if the determinant of the coefficients of $r_{e,1,2}$ is zero.

This leads to the following sixth order equation in v:

$$
\begin{aligned}
& v^6 - 2mv^5 - (q_e^2 + q_1^2 + q_2^2 - m^2)v^4 + 2m(q_1^2 + q_2^2)v^3 \\
& + [q_e^2 q_1^2 + q_1^2 q_2^2 + q_2^2 q_e^2 - q_{e1}^2 q_{1e}^2 - q_{12}^2 q_{21}^2 - q_{e2}^2 q_{2e}^2 - m^2(q_1^2 + q_2^2)]v^2 \\
& + 2m(q_{12}^2 q_{21}^2 - q_1^2 q_2^2)\cdot v \\
& - q_e^2 q_1^2 q_2^2 - q_{e1}^2 q_{12}^2 q_{2e}^2 - q_{e2}^2 q_{1e}^2 q_{21}^2 + q_e^2 q_{12}^2 q_{21}^2 + q_2^2 q_{e1}^2 q_{1e}^2 + q_1^2 q_{e2}^2 q_{2e}^2 \\
& - m^2(q_{12}^2 q_{21}^2 - q_1^2 q_2^2) = 0
\end{aligned}
\tag{4}
$$

A program was written which determines whether all six roots of this equation are real or not and which calculates the highest growth rate in case of complex roots.

Influence of ion mixtures on the instability

In the following we want to get an answer to our main question: Does the mixture of different ion species damp the instability or not? Therefore the growth rate of the instability is calculated for various conditions. The presentation of the data is similar to LASLETT's [8]: The quantities for the electron ring are kept constant (and taken as they are typically measured in the Garching SCHUKO electron ring experiment):

$N_e = 5\cdot 10^{12}$ $\gamma = 27$ $R = 2{,}3$ cm

$a = 0{,}3$ cm $b = 0{,}3$ cm $R_{Squi} = 1{,}55$ cm

The growth rate is determined in a plane of the two parameters: field index n and sum of the two ion loadings $f = f_1 + f_2$. Like in the more usual $Q_1 - Q_i$ - diagrams there is a cusp of the instability area in the f - n-plane for f→0. The n-value of this cusp was given by LASLETT [8]:

$$n_{c1,2} = 2\sqrt{(\rho+Q_{g1,2})Q_{g1,2}} - (\rho+Q_{g1,2})\cdot Q_{g1,2} - \frac{1}{2}\rho\left(\frac{1}{\alpha_E^2} - \frac{\beta^2}{\alpha_M^2}\right) \qquad (5)$$

Tab. 1 a,b,c present this critical n-value for three different cases of electron ring quality as a function of the ion mass and the radius of the "squirrel cage". According to Tab. 1 a,b,c it would be possible to avoid the instability by shifting this cusp to negative n-values which is done by using heavy ions and a strong squirrel cage action.

The following tables show the unstable parameter areas in the f-n-plane. The upper halves of the tables give the real part of the complex frequency (or a zero if all solutions of equations 3 are real), the lower halves give the imaginary part. In case of more than one pair of complex conjugate solutions the most unstable case is selected. The critical field index n_c as calculated from equation 5 is indicated at the bottom of each table. In both halves of the tables not the values of the frequencies themselves but their logarithms are printed out according to the relation

$$\text{Printed value} = \text{INTEGER}\ (100 + 10\ \lg\ (\omega_{r,i}/\omega_o)).$$

To see whether the ion mixture reduces the growth of the instability it is thought of as a gedanken experiment: Without changing any other parameters the field index n is changed at a constant rate. As a relative measure for the total amplitude growth when the cusp is crossed we use the approximate expression $\Delta n \sum \omega_i(n) \propto \int \omega_i(t)dt$ although this applies only under rather stringent conditions (sufficiently small values of $\dot{\omega}_r$, $\dot{\omega}_i$ and sufficiently constant ratios of r_1/r_e and r_2/r_e). To get the above expression the imaginary parts are summed up in horizontal rows of these tables, multiplied with the step width Δn and printed in the last colums, also in a logarithmic form as above.

We choose three examples:

1. A mixture of N^+ and N_2^+ to see if something extraordinary might happen when different kinds of ions of the same gas are present (Tab. 2a,b,c, and 3a,b,c). This corresponds to the situation in a "waiting room" with different ionization states of the same ions.

2. A mixture $^{14}N^+$ and $^{16}O^+$ to see a possible stabilizing effect of similar charge to mass ratios (Tab. 4a,b,c, and 5a,b,c).

3. A mixture of $^1H^+$ and $^{16}O^+$ to see whether harmonic resonances occur between the ions (Tab. 6a,b,c, and 7a,b,c).

Discussion

The comparison of the tables for single species and their mixtures shows no stabilizing effect of the mixing of masses. In order to clarify this point further some selected data of Tab. 2 to 7 are collected to Tab. 8 where some numbers for the growth of the instability are rewritten. Tab. 8 clearly shows that the mixture of different ions does not stabilize the electron-ion ring against the dipole instability 10). The table shows that the instability growth is the bigger the lighter the ions (compared for same fractional loading). For a loading of 2% for example the growth for H^+ ions is about 5 times the growth for N_2^+ ions, and about twice the growth for He^+ ions. So a method to make the instability less dangerous would be the use of heavier ions. This is the same conclusion as drawn above concerning the position of the critical field index. The use of heavy ions (or better: ions with a small charge to mass ratio) is impractical, however, because of the limited holding power of the ring during acceleration. The increase of the ring quality seems therefore necessary not only for a higher holding power but also for suppression of the electron ion resonances.

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9. Formula (A-8;b) in Ref. 5

10. L.J. LASLETT came to a similar result: that the resonances arising, in the region of small ion loading, may be rather precisely accounted for by the superposition of resonant regions obtained by considering just one ion species to be present at one time.

```
ELEKTRONENZAHL, GAMMA:     5.000D 12   2.700D 01
RINGEOMETRIE:      R, a, b    (CM):    2.300D 00   3.000D-01   3.000D-01
RHO =     4.245D-01
```

squirrel cage radius (cm)	1	2	4	8	16	32	64	128	256
4.00	0.1477	0.1029	0.0712	0.0486	0.0326	0.0212	0.0131	0.0073	0.0033
3.95	0.1473	0.1025	0.0708	0.0482	0.0322	0.0208	0.0127	0.0069	0.0029
3.90	0.1468	0.1021	0.0703	0.0478	0.0317	0.0203	0.0122	0.0065	0.0024
3.85	0.1463	0.1016	0.0698	0.0473	0.0312	0.0198	0.0117	0.0060	0.0019
3.80	0.1458	0.1011	0.0693	0.0467	0.0307	0.0193	0.0112	0.0055	0.0014
3.75	0.1452	0.1005	0.0687	0.0461	0.0301	0.0187	0.0106	0.0049	0.0008
3.70	0.1445	0.0998	0.0681	0.0455	0.0294	0.0180	0.0099	0.0042	0.0001
3.65	0.1438	0.0991	0.0673	0.0447	0.0287	0.0173	0.0092	0.0035	-0.0006
3.60	0.1430	0.0982	0.0665	0.0439	0.0279	0.0165	0.0084	0.0026	-0.0014
3.55	0.1421	0.0973	0.0656	0.0430	0.0270	0.0155	0.0075	0.0017	-0.0024
3.50	0.1410	0.0963	0.0645	0.0420	0.0259	0.0145	0.0064	0.0007	-0.0034
3.45	0.1398	0.0951	0.0634	0.0408	0.0247	0.0133	0.0052	-0.0005	-0.0046
3.40	0.1385	0.0938	0.0620	0.0394	0.0234	0.0120	0.0039	-0.0018	-0.0059
3.35	0.1370	0.0922	0.0605	0.0379	0.0219	0.0104	0.0024	-0.0034	-0.0075
3.30	0.1352	0.0904	0.0587	0.0361	0.0201	0.0087	0.0006	-0.0052	-0.0092
3.25	0.1331	0.0884	0.0566	0.0341	0.0180	0.0066	-0.0015	-0.0072	-0.0113
3.20	0.1307	0.0860	0.0542	0.0316	0.0156	0.0042	-0.0039	-0.0096	-0.0137
3.15	0.1279	0.0831	0.0514	0.0288	0.0127	0.0013	-0.0068	-0.0125	-0.0166
3.10	0.1244	0.0797	0.0480	0.0254	0.0093	-0.0021	-0.0102	-0.0159	-0.0200
3.05	0.1203	0.0756	0.0438	0.0213	0.0052	-0.0062	-0.0143	-0.0200	-0.0241
3.00	0.1153	0.0706	0.0388	0.0162	0.0002	-0.0112	-0.0193	-0.0250	-0.0291
2.95	0.1091	0.0643	0.0326	0.0100	-0.0060	-0.0174	-0.0255	-0.0313	-0.0353
2.90	0.1012	0.0565	0.0247	0.0022	-0.0139	-0.0253	-0.0334	-0.0391	-0.0432
2.85	0.0911	0.0464	0.0147	-0.0079	-0.0240	-0.0354	-0.0435	-0.0492	-0.0533
2.80	0.0779	0.0331	0.0014	-0.0212	-0.0372	-0.0486	-0.0567	-0.0625	-0.0665
2.75	0.0600	0.0152	-0.0165	-0.0391	-0.0551	-0.0666	-0.0746	-0.0804	-0.0845
2.70	0.0349	-0.0098	-0.0416	-0.0642	-0.0802	-0.0916	-0.0997	-0.1054	-0.1095
2.65	-0.0016	-0.0464	-0.0781	-0.1007	-0.1168	-0.1282	-0.1362	-0.1420	-0.1461
2.60	-0.0579	-0.1027	-0.1344	-0.1570	-0.1731	-0.1845	-0.1926	-0.1983	-0.2024

ion mass

Tab. 1a

critical n-value

```
ELEKTRONENZAHL, GAMMA:    5.000D 12  2.700D 01
RINGEOMETRIE:  R, a, b     (CM):     2.300D 00   2.000D-01   2.000D-01
RHO =    9.551D-01

4.00      0.2180   0.1546   0.1087   0.0756   0.0518   0.0349   0.0229   0.0143   0.0082
3.95      0.2176   0.1542   0.1082   0.0752   0.0514   0.0345   0.0224   0.0139   0.0078
3.90      0.2172   0.1538   0.1078   0.0747   0.0510   0.0341   0.0220   0.0134   0.0073
3.85      0.2167   0.1533   0.1073   0.0742   0.0505   0.0336   0.0215   0.0129   0.0069
3.80      0.2161   0.1527   0.1068   0.0737   0.0500   0.0330   0.0210   0.0124   0.0063
3.75      0.2155   0.1521   0.1062   0.0731   0.0494   0.0324   0.0204   0.0118   0.0057
3.70      0.2149   0.1515   0.1055   0.0724   0.0487   0.0318   0.0197   0.0111   0.0051
3.65      0.2141   0.1507   0.1048   0.0717   0.0480   0.0310   0.0190   0.0104   0.0043
3.60      0.2133   0.1499   0.1040   0.0709   0.0472   0.0302   0.0182   0.0096   0.0035
3.55      0.2124   0.1490   0.1030   0.0699   0.0462   0.0293   0.0172   0.0087   0.0026
3.50      0.2114   0.1480   0.1020   0.0689   0.0452   0.0283   0.0162   0.0076   0.0015
3.45      0.2102   0.1468   0.1008   0.0677   0.0440   0.0271   0.0150   0.0064   0.0004
3.40      0.2088   0.1454   0.0995   0.0664   0.0427   0.0257   0.0137   0.0051  -0.0010
3.35      0.2073   0.1439   0.0979   0.0648   0.0411   0.0242   0.0121   0.0036  -0.0025
3.30      0.2055   0.1421   0.0962   0.0631   0.0394   0.0224   0.0104   0.0013  -0.0043
3.25      0.2035   0.1401   0.0941   0.0610   0.0373   0.0204   0.0083  -0.0003  -0.0064
3.20      0.2010   0.1376   0.0917   0.0586   0.0349   0.0179   0.0059  -0.0027  -0.0088
3.15      0.1982   0.1348   0.0888   0.0557   0.0320   0.0151   0.0030  -0.0055  -0.0116
3.10      0.1948   0.1314   0.0854   0.0523   0.0286   0.0117  -0.0004  -0.0090  -0.0150
3.05      0.1907   0.1273   0.0813   0.0482   0.0245   0.0076  -0.0045  -0.0131  -0.0192
3.00      0.1856   0.1222   0.0763   0.0432   0.0195   0.0025  -0.0095  -0.0181  -0.0242
2.95      0.1794   0.1160   0.0701   0.0370   0.0132  -0.0037  -0.0158  -0.0243  -0.0304
2.90      0.1716   0.1082   0.0622   0.0291   0.0054  -0.0115  -0.0236  -0.0322  -0.0383
2.85      0.1615   0.0981   0.0521   0.0190  -0.0047  -0.0216  -0.0337  -0.0423  -0.0483
2.80      0.1482   0.0848   0.0389   0.0058  -0.0180  -0.0349  -0.0469  -0.0555  -0.0616
2.75      0.1303   0.0669   0.0209  -0.0122  -0.0359  -0.0528  -0.0649  -0.0734  -0.0795
2.70      0.1052   0.0418  -0.0041  -0.0372  -0.0609  -0.0779  -0.0899  -0.0985  -0.1046
2.65      0.0687   0.0053  -0.0407  -0.0738  -0.0975  -0.1144  -0.1265  -0.1350  -0.1411
2.60      0.0124  -0.0510  -0.0970  -0.1301  -0.1538  -0.1707  -0.1828  -0.1913  -0.1974
2.55     -0.0810  -0.1444  -0.1904  -0.2234  -0.2472  -0.2641  -0.2762  -0.2847  -0.2908
2.50     -0.2529  -0.3163  -0.3623  -0.3954  -0.4191  -0.4360  -0.4481  -0.4566  -0.4627

                1        2        4        8       16       32       64      128      256
```

squirrel cage
radius (cm)

ion mass

Tab. 1b

critical n-value

```
ELEKTRONENZAHL, GAMMA:    5.000D 12  2.700D 01
RINGEOMETRIE: R,  a,  b     (CM):    2.300D 00  1.000D-01  1.000D-01
RHO =    3.820D 00

4.00       0.4121  0.3010  0.2167  0.1542  0.1086  0.0756  0.0520  0.0350  0.0230
3.95       0.4117  0.3006  0.2163  0.1538  0.1082  0.0752  0.0516  0.0346  0.0226
3.90       0.4113  0.3001  0.2158  0.1533  0.1077  0.0748  0.0511  0.0342  0.0221
3.85       0.4108  0.2996  0.2153  0.1529  0.1073  0.0743  0.0506  0.0337  0.0216
3.80       0.4103  0.2991  0.2148  0.1523  0.1067  0.0738  0.0501  0.0332  0.0211
3.75       0.4097  0.2985  0.2142  0.1517  0.1061  0.0732  0.0495  0.0326  0.0205
3.70       0.4090  0.2978  0.2135  0.1511  0.1055  0.0725  0.0488  0.0319  0.0199
3.65       0.4083  0.2971  0.2128  0.1503  0.1047  0.0718  0.0481  0.0312  0.0191
3.60       0.4074  0.2963  0.2120  0.1495  0.1039  0.0709  0.0473  0.0303  0.0183
3.55       0.4065  0.2953  0.2110  0.1486  0.1030  0.0700  0.0463  0.0294  0.0174
3.50       0.4055  0.2943  0.2100  0.1475  0.1019  0.0690  0.0453  0.0284  0.0163
3.45       0.4043  0.2931  0.2088  0.1464  0.1008  0.0678  0.0441  0.0272  0.0152
3.40       0.4030  0.2918  0.2075  0.1450  0.0994  0.0665  0.0428  0.0259  0.0138
3.35       0.4014  0.2902  0.2059  0.1435  0.0979  0.0649  0.0412  0.0243  0.0123
3.30       0.3997  0.2885  0.2042  0.1417  0.0961  0.0631  0.0395  0.0226  0.0105
3.25       0.3976  0.2864  0.2021  0.1396  0.0940  0.0611  0.0374  0.0205  0.0084
3.20       0.3952  0.2840  0.1997  0.1372  0.0916  0.0587  0.0350  0.0181  0.0060
3.15       0.3923  0.2811  0.1968  0.1344  0.0888  0.0558  0.0321  0.0152  0.0032
3.10       0.3889  0.2777  0.1934  0.1310  0.0854  0.0524  0.0287  0.0118 -0.0002
3.05       0.3848  0.2736  0.1893  0.1268  0.0812  0.0483  0.0246  0.0077 -0.0044
3.00       0.3798  0.2686  0.1843  0.1218  0.0762  0.0433  0.0196  0.0027 -0.0094
2.95       0.3735  0.2624  0.1781  0.1156  0.0700  0.0370  0.0134 -0.0036 -0.0156
2.90       0.3657  0.2545  0.1702  0.1077  0.0621  0.0292  0.0055 -0.0114 -0.0235
2.85       0.3556  0.2444  0.1601  0.0977  0.0521  0.0191 -0.0046 -0.0215 -0.0335
2.80       0.3423  0.2312  0.1469  0.0844  0.0388  0.0058 -0.0178 -0.0348 -0.0468
2.75       0.3244  0.2132  0.1289  0.0665  0.0209 -0.0121 -0.0358 -0.0527 -0.0647
2.70       0.2994  0.1882  0.1039  0.0414 -0.0042 -0.0371 -0.0608 -0.0777 -0.0898
2.65       0.2628  0.1516  0.0673  0.0049 -0.0407 -0.0737 -0.0974 -0.1143 -0.1263
2.60       0.2065  0.0953  0.0110 -0.0514 -0.0970 -0.1300 -0.1537 -0.1706 -0.1826
2.55       0.1131  0.0020 -0.0823 -0.1448 -0.1904 -0.2234 -0.2470 -0.2640 -0.2760
2.50      -0.0588 -0.1700 -0.2543 -0.3167 -0.3623 -0.3953 -0.4190 -0.4359 -0.4479
2.45      -0.4302 -0.5414 -0.6257 -0.6881 -0.7337 -0.7667 -0.7904 -0.8073 -0.8193
2.40      -1.4914 -1.6025 -1.6868 -1.7493 -1.7949 -1.8279 -1.8515 -1.8685 -1.8805

                1       2       4       8      16      32      64     128     256
```

squirrel cage
radius (cm)

ion mass

critical n-value

Tab. 1c

f (x10^3)	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76
300	0	0	75	75	75	75	75	75	75	76	76	76	76	76	76	76	76	77	77	77	77	77	77	77	77	78	78	78	78	78	78	78	78	79	79	79	79	79	79
200	0	0	0	76	76	77	77	77	77	77	77	77	78	78	78	78	78	78	78	79	79	79	79	79	79	79	80	80	80	80	80	80	80	80	81	81	81	81	81
180	0	0	0	77	77	77	77	77	77	78	78	78	78	78	78	78	79	79	79	79	79	79	79	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81
160	0	0	0	0	77	77	77	78	78	78	78	78	78	79	79	79	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	82	82	82
140	0	0	0	0	78	78	78	78	78	78	79	79	79	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	82	82	82	82	82	82
120	0	0	0	0	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	82	82
100	0	0	0	0	0	79	79	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	82	83	83	83	83
80	0	0	0	0	0	0	79	79	79	80	80	80	80	80	80	81	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83
60	0	0	0	0	0	0	0	80	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83
40	0	0	0	0	0	0	0	0	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	83	84	84	84
20	0	0	0	0	0	0	0	0	0	0	0	81	81	81	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	83	84	84	84	84	84	0
18	0	0	0	0	0	0	0	0	0	0	0	0	81	81	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84	84	84	84	84	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	81	82	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84	84	84	84	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	81	82	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84	84	84	84	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	81	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	83	84	84	84	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	81	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	83	84	84	84	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84	84	84	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84	84	84	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84	84	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	83	83	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	83	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	82	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

f (x10^3)	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	n(x10^3)
300	0	0	69	74	75	76	77	77	77	78	78	78	79	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	82	82	82	82	82	*
200	0	0	0	72	75	76	77	77	78	78	78	79	79	79	79	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	*
180	0	0	0	70	74	76	77	77	78	78	78	79	79	79	79	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	82	82	82	82	82	82	82	*
160	0	0	0	0	74	76	77	77	78	78	78	79	79	79	79	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	81	82	82	82	82	82	82	*
140	0	0	0	0	73	75	76	77	78	78	78	79	79	79	79	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	81	81	81	82	82	82	82	*
120	0	0	0	0	69	75	76	77	77	78	78	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	*
100	0	0	0	0	0	73	75	76	77	78	78	78	79	79	79	79	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	*
80	0	0	0	0	0	0	74	76	77	77	78	78	78	79	79	79	79	80	80	80	80	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	*
60	0	0	0	0	0	0	0	73	75	76	77	78	78	78	79	79	79	79	79	79	79	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	*
40	0	0	0	0	0	0	0	0	69	74	76	76	77	77	78	78	78	78	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	78	*
20	0	0	0	0	0	0	0	0	0	0	0	71	74	75	76	76	77	77	77	77	78	78	78	78	78	78	78	78	78	77	77	77	77	77	76	75	74	72	0	65
18	0	0	0	0	0	0	0	0	0	0	0	0	73	75	76	76	76	77	77	77	77	77	77	78	78	78	77	77	77	77	77	77	76	76	75	74	72	0	0	64
17	0	0	0	0	0	0	0	0	0	0	0	0	73	74	75	76	76	77	77	77	77	77	77	77	77	77	77	77	77	77	77	76	76	76	75	73	0	0	0	64
16	0	0	0	0	0	0	0	0	0	0	0	0	72	74	75	76	76	77	77	77	77	77	77	77	77	77	77	77	77	77	77	76	76	75	74	71	0	0	0	64
15	0	0	0	0	0	0	0	0	0	0	0	0	71	74	75	76	76	76	77	77	77	77	77	77	77	77	77	77	77	77	76	76	75	75	73	0	0	0	0	63
14	0	0	0	0	0	0	0	0	0	0	0	0	67	73	75	75	76	76	76	77	77	77	77	77	77	77	77	77	77	76	76	76	75	74	71	0	0	0	0	63
13	0	0	0	0	0	0	0	0	0	0	0	0	0	73	74	75	76	76	76	76	77	77	77	77	77	77	77	77	76	76	76	75	74	72	0	0	0	0	0	63
12	0	0	0	0	0	0	0	0	0	0	0	0	0	72	74	75	75	76	76	76	76	77	77	77	77	77	76	76	76	76	75	75	73	69	0	0	0	0	0	62
11	0	0	0	0	0	0	0	0	0	0	0	0	0	70	73	74	75	76	76	76	76	76	76	76	76	76	76	76	76	75	75	74	72	0	0	0	0	0	0	62
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73	74	75	75	76	76	76	76	76	76	76	76	76	76	75	75	74	73	0	0	0	0	0	0	0	61
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	74	75	75	75	76	76	76	76	76	76	76	76	75	75	74	73	70	0	0	0	0	0	0	0	61
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69	73	74	75	75	75	76	76	76	76	76	76	75	75	74	73	71	0	0	0	0	0	0	0	0	61
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	74	74	75	75	75	75	76	75	75	75	75	74	74	72	0	0	0	0	0	0	0	0	0	60
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	73	74	74	75	75	75	75	75	75	75	74	74	72	68	0	0	0	0	0	0	0	0	0	59
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	73	74	74	75	75	75	75	75	74	74	73	70	0	0	0	0	0	0	0	0	0	0	58
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	72	73	74	74	74	74	74	74	73	73	70	0	0	0	0	0	0	0	0	0	0	0	58
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	71	72	73	74	74	74	73	73	72	70	0	0	0	0	0	0	0	0	0	0	0	0	56
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	71	72	73	73	73	72	72	69	0	0	0	0	0	0	0	0	0	0	0	0	0	54
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	71	71	71	70	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–

n_c

Tab. 2a

100 % N$^+$, without squirrel cage

	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76
300	0	0	73	73	73	74	74	74	74	74	74	74	75	75	75	75	75	75	75	76	76	76	76	76	76	76	77	77	77	77	77	77	77	78	78	78	78	78	78
200	0	0	75	75	75	75	75	76	76	76	76	76	76	77	77	77	77	77	77	78	78	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80	81
180	0	0	75	75	75	76	76	76	76	76	77	77	77	77	77	77	78	78	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81
160	0	0	0	76	76	76	76	76	77	77	77	77	77	78	78	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81
140	0	0	0	76	76	76	77	77	77	77	77	78	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82
120	0	0	0	76	77	77	77	77	77	78	78	78	78	78	79	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82
100	0	0	0	0	77	77	78	78	78	78	78	79	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	83
80	0	0	0	0	78	78	78	78	78	79	79	79	79	79	80	80	80	80	80	80	81	81	81	81	81	81	82	82	82	82	82	82	82	82	82	83	83	83	83
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40	0	0	0	0	0	0	79	79	79	80	80	80	80	80	81	81	81	81	81	81	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84
20	0	0	0	0	0	0	0	0	80	80	80	80	81	81	81	81	81	81	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84	84	0	0	0
18	0	0	0	0	0	0	0	0	80	80	80	80	81	81	81	81	81	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	84	84	0	0	0	0
17	0	0	0	0	0	0	0	0	0	80	80	80	81	81	81	81	81	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	84	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	80	80	80	81	81	81	81	81	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	80	80	80	81	81	81	81	81	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	80	80	80	81	81	81	81	81	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	84	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	80	80	81	81	81	81	81	81	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	80	81	81	81	81	81	81	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	80	81	81	81	81	81	81	82	82	82	82	82	83	83	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0
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6	0	0	0	0	0	0	0	0	0	0	0	81	81	81	81	81	81	82	82	82	82	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	81	81	81	81	81	81	82	82	82	82	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	81	81	81	81	81	82	0	82	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	81	81	81	81	81	82	0	82	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	81	81	81	81	82	0	82	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81	81	81	0	0	0	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

$f\,(\times 10^3)$	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	$n\,(\times 10^3)$
300	0	0	72	74	75	76	76	77	77	77	78	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	*
200	0	0	70	74	75	76	76	77	77	78	78	78	79	79	79	79	79	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	81	81	82	*
180	0	0	68	74	75	76	77	77	77	78	78	78	79	79	79	79	79	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	81	81	81	*
160	0	0	0	73	75	76	77	77	77	78	78	78	79	79	79	79	79	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	81	81	81	*
140	0	0	0	73	75	76	76	77	77	78	78	78	79	79	79	79	79	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	81	81	81	*
120	0	0	0	71	74	76	76	77	77	78	78	78	79	79	79	79	79	80	80	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	81	*
100	0	0	0	0	74	75	76	77	77	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	*
80	0	0	0	0	72	74	76	76	77	77	78	78	78	79	79	79	79	79	79	79	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	*
60	0	0	0	0	0	72	75	76	76	77	77	78	78	78	78	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	*
40	0	0	0	0	0	0	71	74	75	76	76	77	77	77	78	78	78	78	78	78	78	78	78	79	79	79	79	79	79	79	78	78	78	78	78	78	78	78	77	*
20	0	0	0	0	0	0	0	0	70	73	74	75	76	76	76	76	76	77	77	77	77	77	77	77	77	77	77	77	77	76	76	76	75	75	73	66	0	0	0	64
18	0	0	0	0	0	0	0	0	64	73	74	75	75	76	76	76	76	76	76	76	76	77	77	77	77	77	77	76	76	76	76	75	74	73	68	0	0	0	0	63
17	0	0	0	0	0	0	0	0	0	72	74	75	75	75	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	75	75	74	72	0	0	0	0	0	63
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15	0	0	0	0	0	0	0	0	0	71	73	74	75	75	75	76	76	76	76	76	76	76	76	76	76	76	76	76	76	75	75	74	72	0	0	0	0	0	0	63
14	0	0	0	0	0	0	0	0	0	70	73	74	75	75	75	75	75	76	76	76	76	76	76	76	76	76	76	76	75	75	74	73	69	0	0	0	0	0	0	62
13	0	0	0	0	0	0	0	0	0	68	73	74	74	75	75	75	75	75	75	75	76	76	76	76	76	76	76	75	75	74	74	72	0	0	0	0	0	0	0	62
12	0	0	0	0	0	0	0	0	0	0	72	73	74	75	75	75	75	75	75	75	75	75	76	76	76	75	75	75	75	74	73	68	0	0	0	0	0	0	0	62
11	0	0	0	0	0	0	0	0	0	0	71	73	74	74	75	75	75	75	75	75	75	75	75	75	75	75	75	75	74	73	71	0	0	0	0	0	0	0	0	61
10	0	0	0	0	0	0	0	0	0	0	70	73	74	74	74	75	75	74	74	74	75	75	75	75	75	75	75	74	74	72	60	0	0	0	0	0	0	0	0	61
9	0	0	0	0	0	0	0	0	0	0	69	72	73	74	74	74	74	74	74	74	74	75	75	75	75	75	74	74	73	70	0	0	0	0	0	0	0	0	0	60
8	0	0	0	0	0	0	0	0	0	0	0	72	73	73	74	74	74	74	73	74	74	74	75	75	75	74	74	73	72	0	0	0	0	0	0	0	0	0	0	60
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6	0	0	0	0	0	0	0	0	0	0	0	69	72	73	73	73	73	73	71	73	73	74	74	74	74	73	72	70	0	0	0	0	0	0	0	0	0	0	0	59
5	0	0	0	0	0	0	0	0	0	0	0	65	71	72	73	73	73	72	69	72	73	73	73	73	73	72	71	0	0	0	0	0	0	0	0	0	0	0	0	58
4	0	0	0	0	0	0	0	0	0	0	0	0	70	72	72	72	72	71	0	71	72	73	73	73	72	71	67	0	0	0	0	0	0	0	0	0	0	0	0	57
3	0	0	0	0	0	0	0	0	0	0	0	0	67	71	71	72	71	70	0	70	72	72	72	72	71	68	0	0	0	0	0	0	0	0	0	0	0	0	0	56
2	0	0	0	0	0	0	0	0	0	0	0	0	0	69	70	71	70	66	0	69	71	71	71	71	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69	69	68	0	0	0	69	70	69	67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–

n_c'/N_2^+ n_c'/N^+

50 % N^+, 50 % N_2^+, without squirrel cage

Tab. 2b

f $(\times 10^3)$	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	n $(\times 10^3)$
300	0	72	72	72	72	72	72	73	73	73	73	73	73	73	74	74	74	74	74	74	74	75	75	75	75	75	75	76	76	76	76	76	76	76	77	77	77	77	77	
200	0	0	74	74	74	74	74	74	75	75	75	75	75	76	76	76	76	76	76	77	77	77	77	77	78	78	78	78	78	78	79	79	79	79	79	79	79	80	80	
180	0	0	74	74	74	75	75	75	75	75	75	76	76	76	76	76	77	77	77	77	77	78	78	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	
160	0	0	74	75	75	75	75	75	76	76	76	76	76	77	77	77	77	77	78	78	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80	81	81	
140	0	0	75	75	75	75	76	76	76	76	76	77	77	77	77	77	78	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	81	81	81	81	81	81	
120	0	0	0	76	76	76	76	76	77	77	77	77	77	78	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	81	81	81	81	81	81	81	81	82	
100	0	0	0	76	76	77	77	77	77	77	78	78	78	78	78	79	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	
80	0	0	0	77	77	77	77	78	78	78	78	78	79	79	79	79	79	80	80	80	80	80	80	81	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	
60	0	0	0	0	77	78	78	78	78	79	79	79	79	79	80	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	82	83	83	83	
40	0	0	0	0	0	78	79	79	79	79	79	80	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	83	83	83	83	83	83	0	
20	0	0	0	0	0	0	0	79	80	80	80	80	80	80	81	81	81	81	81	81	82	82	82	82	82	82	82	82	82	83	0	0	0	0	0	0	0	0	0	
18	0	0	0	0	0	0	0	79	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	83	0	0	0	0	0	0	0	0	0	0	
17	0	0	0	0	0	0	0	0	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	
16	0	0	0	0	0	0	0	0	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	
15	0	0	0	0	0	0	0	0	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	
14	0	0	0	0	0	0	0	0	80	80	80	80	80	81	81	81	81	81	81	82	82	82	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	
13	0	0	0	0	0	0	0	0	80	80	80	80	80	81	81	81	81	81	81	82	82	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	0	0	0	0	0	0	0	0	80	80	80	80	80	81	81	81	81	81	81	82	82	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	0	0	0	0	0	0	0	0	0	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	0	0	0	0	0	0	0	0	0	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	0	0	0	0	0	0	0	0	0	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	0	0	0	0	0	0	0	0	0	80	80	80	81	81	81	81	81	81	82	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	0	0	0	0	0	0	0	0	0	0	80	80	81	81	81	81	81	81	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	0	0	0	0	0	0	0	0	0	0	80	80	81	81	81	81	81	81	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	0	0	0	0	0	0	0	0	0	0	0	81	81	81	81	81	81	81	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	0	0	81	81	81	81	81	81	81	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	0	0	0	0	0	0	81	81	81	81	81	81	81	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	0	0	0	81	81	81	81	81	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	81	81	81	81	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
300	0	66	72	74	75	75	76	76	76	77	77	77	78	78	78	78	78	79	79	79	79	79	79	79	80	80	80	80	80	80	80	80	80	80	81	81	81	81	81	*
200	0	0	72	74	75	76	76	77	77	77	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	*
180	0	0	72	74	75	76	76	77	77	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	*
160	0	0	71	74	75	76	76	77	77	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	*
140	0	0	70	74	75	76	76	77	77	78	78	78	78	79	79	79	79	79	80	80	80	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	*
120	0	0	0	73	75	76	76	77	77	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	*
100	0	0	0	72	75	76	76	77	77	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	*
80	0	0	0	69	74	75	76	77	77	78	78	78	78	79	79	79	79	79	79	79	79	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	79	79	*
60	0	0	0	0	72	74	76	76	77	77	78	78	78	78	78	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	78	78	78	*
40	0	0	0	0	0	71	74	75	76	77	77	77	77	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77	77	77	76	76	75	72	0	66
20	0	0	0	0	0	0	0	71	74	75	75	76	76	76	77	77	77	77	77	77	77	77	77	77	76	76	76	75	74	71	0	0	0	0	0	0	0	0	0	63
18	0	0	0	0	0	0	0	68	73	74	75	76	76	76	76	77	77	77	77	77	77	77	76	76	76	75	75	74	71	0	0	0	0	0	0	0	0	0	0	63
17	0	0	0	0	0	0	0	0	73	74	75	76	76	76	76	76	77	77	77	77	77	76	76	76	76	75	74	73	0	0	0	0	0	0	0	0	0	0	0	62
16	0	0	0	0	0	0	0	0	72	74	75	75	76	76	76	76	76	76	76	76	76	76	76	76	75	75	74	71	0	0	0	0	0	0	0	0	0	0	0	62
15	0	0	0	0	0	0	0	0	72	74	75	75	76	76	76	76	76	76	76	76	76	76	76	75	75	74	73	0	0	0	0	0	0	0	0	0	0	0	0	62
14	0	0	0	0	0	0	0	0	71	73	74	75	75	76	76	76	76	76	76	76	76	76	76	75	75	74	71	0	0	0	0	0	0	0	0	0	0	0	0	61
13	0	0	0	0	0	0	0	0	70	73	74	75	75	76	76	76	76	76	76	76	76	76	75	75	74	73	0	0	0	0	0	0	0	0	0	0	0	0	0	61
12	0	0	0	0	0	0	0	0	65	73	74	75	75	75	76	76	76	76	76	76	76	75	75	74	73	71	0	0	0	0	0	0	0	0	0	0	0	0	0	61
11	0	0	0	0	0	0	0	0	0	72	74	74	75	75	75	76	76	76	76	76	75	75	75	74	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
10	0	0	0	0	0	0	0	0	0	71	73	74	75	75	75	75	75	75	75	75	75	75	74	73	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
9	0	0	0	0	0	0	0	0	0	70	73	74	74	75	75	75	75	75	75	75	75	74	73	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
8	0	0	0	0	0	0	0	0	0	64	72	73	74	75	75	75	75	75	75	75	74	74	72	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59
7	0	0	0	0	0	0	0	0	0	0	71	73	74	74	75	75	75	75	75	74	74	73	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58
6	0	0	0	0	0	0	0	0	0	0	70	72	73	74	74	74	74	74	74	74	73	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58
5	0	0	0	0	0	0	0	0	0	0	0	72	73	73	74	74	74	74	74	73	72	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57
4	0	0	0	0	0	0	0	0	0	0	0	70	72	73	73	74	74	73	73	72	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56
3	0	0	0	0	0	0	0	0	0	0	0	64	71	72	73	73	73	73	72	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55
2	0	0	0	0	0	0	0	0	0	0	0	0	69	71	72	72	72	71	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53
1	0	0	0	0	0	0	0	0	0	0	0	0	0	68	70	71	70	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–

↑ n_c

Tab. 2c

100 % N_2^+, without squirrel cage

f(x10^3)	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	-4	-2	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46
300	0	0	0	0	75	75	75	75	75	76	76	76	76	76	76	76	76	77	77	77	77	77	77	77	77	78	78	78	78	78	78	78	78	79	79	79	79	79	79
200	0	0	0	0	77	77	77	77	77	77	77	78	78	78	78	78	78	78	79	79	79	79	79	79	79	80	80	80	80	80	80	80	80	81	81	81	81	81	81
180	0	0	0	0	77	77	77	77	78	78	78	78	78	78	78	79	79	79	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	82
160	0	0	0	0	77	77	78	78	78	78	78	78	79	79	79	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	82	82	82	82
140	0	0	0	0	78	78	78	78	78	79	79	79	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82
120	0	0	0	0	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	82	83	83
100	0	0	0	0	0	79	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	82	83	83	83	83	83
80	0	0	0	0	0	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83
60	0	0	0	0	0	0	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	83	84
40	0	0	0	0	0	0	0	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84	84	84	84	84
20	0	0	0	0	0	0	0	0	0	0	81	81	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	83	84	84	84	84	84	0	0	0
18	0	0	0	0	0	0	0	0	0	0	81	81	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84	84	84	84	84	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	81	81	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84	84	84	84	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84	84	84	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84	84	84	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	83	84	84	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84	84	84	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84	84	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84	84	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	82	83	83	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	83	83	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	82	82	83	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	82	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

f(x10^3)	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	-4	-2	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	η(x10^3)
300	0	0	0	0	72	74	76	76	77	77	78	78	78	79	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	82	82	82	82	*
200	0	0	0	0	73	75	76	77	77	78	78	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	82	82	82	82	82	82	*
180	0	0	0	0	73	75	76	77	77	78	78	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	82	82	82	82	82	82	*
160	0	0	0	0	73	75	76	77	78	78	78	79	79	79	79	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	81	81	82	82	82	82	82	*
140	0	0	0	0	72	75	76	77	78	78	78	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	*
120	0	0	0	0	70	75	76	77	77	78	78	79	79	79	79	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	*
100	0	0	0	0	0	74	76	77	77	78	78	78	79	79	79	79	80	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	81	81	81	*
80	0	0	0	0	0	71	75	76	77	77	78	78	79	79	79	79	79	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	*
60	0	0	0	0	0	0	72	75	76	77	77	78	78	78	79	79	79	79	79	79	79	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	*
40	0	0	0	0	0	0	0	69	74	76	76	77	77	78	78	78	78	78	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	78	78	78	78	*
20	0	0	0	0	0	0	0	0	0	0	73	75	75	76	76	77	77	77	77	77	78	78	78	78	78	77	77	77	77	77	77	76	76	75	74	64	0	0	0	64
18	0	0	0	0	0	0	0	0	0	0	71	74	75	76	76	77	77	77	77	77	77	77	77	77	77	77	77	77	77	76	76	76	75	73	65	0	0	0	0	64
17	0	0	0	0	0	0	0	0	0	0	69	74	75	76	76	76	77	77	77	77	77	77	77	77	77	77	77	77	77	76	76	75	74	72	0	0	0	0	0	63
16	0	0	0	0	0	0	0	0	0	0	0	73	75	75	76	76	77	77	77	77	77	77	77	77	77	77	77	77	76	76	75	75	73	0	0	0	0	0	0	63
15	0	0	0	0	0	0	0	0	0	0	0	73	74	75	76	76	75	77	77	77	77	77	77	77	77	77	77	76	76	76	75	74	72	0	0	0	0	0	0	63
14	0	0	0	0	0	0	0	0	0	0	0	72	74	75	75	76	76	76	77	77	77	77	77	77	77	77	76	76	76	75	74	73	0	0	0	0	0	0	0	63
13	0	0	0	0	0	0	0	0	0	0	0	70	73	75	75	76	76	76	76	77	77	77	77	77	76	76	76	76	75	75	74	71	0	0	0	0	0	0	0	62
12	0	0	0	0	0	0	0	0	0	0	0	66	73	74	75	76	76	76	76	76	76	76	76	76	76	76	76	75	75	74	72	0	0	0	0	0	0	0	0	62
11	0	0	0	0	0	0	0	0	0	0	0	0	72	74	75	75	76	76	76	76	76	76	76	76	76	76	76	75	74	73	69	0	0	0	0	0	0	0	0	62
10	0	0	0	0	0	0	0	0	0	0	0	0	71	73	74	75	75	76	76	76	76	76	76	76	76	76	75	75	74	72	0	0	0	0	0	0	0	0	0	61
9	0	0	0	0	0	0	0	0	0	0	0	0	69	73	74	75	75	75	76	76	76	76	76	76	75	75	75	74	73	0	0	0	0	0	0	0	0	0	0	61
8	0	0	0	0	0	0	0	0	0	0	0	0	0	72	74	74	75	75	75	76	76	76	76	75	75	75	74	73	70	0	0	0	0	0	0	0	0	0	0	60
7	0	0	0	0	0	0	0	0	0	0	0	0	0	71	73	74	75	75	75	75	75	75	75	75	75	74	73	71	0	0	0	0	0	0	0	0	0	0	0	60
6	0	0	0	0	0	0	0	0	0	0	0	0	0	67	72	74	74	75	75	75	75	75	75	75	74	73	72	0	0	0	0	0	0	0	0	0	0	0	0	59
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	71	73	74	74	74	75	75	75	74	74	73	72	67	0	0	0	0	0	0	0	0	0	0	0	0	58
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67	72	73	74	74	74	74	74	74	73	72	69	0	0	0	0	0	0	0	0	0	0	0	0	0	57
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	72	73	73	73	73	73	73	72	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	72	72	73	73	72	71	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69	71	71	71	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-

n_c'

Tab. 3a

100 % N^+, with squirrel cage

f(x10^3)	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	-4	-2	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	
300	0	0	0	0	73	73	74	74	74	74	74	74	74	75	75	75	75	75	75	76	76	76	76	76	76	76	77	77	77	77	77	77	78	78	78	78	78	78	78	
200	0	0	0	75	75	75	75	76	76	76	76	76	77	77	77	77	77	77	78	78	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80	81	81	
180	0	0	0	75	75	76	76	76	76	76	77	77	77	77	77	78	78	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	
160	0	0	0	76	76	76	76	77	77	77	77	77	77	78	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81	82	
140	0	0	0	76	76	77	77	77	77	77	78	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	81	81	81	81	81	81	81	81	82	82	82	82	
120	0	0	0	77	77	77	77	77	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	81	81	81	81	81	81	81	81	82	82	82	82	82	82	82	
100	0	0	0	77	77	78	78	78	78	78	79	79	79	79	79	80	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	82	83	83	
80	0	0	0	0	78	78	78	79	79	79	79	79	80	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	83	83	83	83	83	83	
60	0	0	0	0	78	79	79	79	79	79	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	
40	0	0	0	0	0	79	79	80	80	80	80	80	80	81	81	81	81	81	81	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84	84	84	
20	0	0	0	0	0	0	0	80	80	80	81	81	81	81	81	81	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	84	0	0	0	0	0	0	
18	0	0	0	0	0	0	0	80	80	80	81	81	81	81	81	81	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	84	0	0	0	0	0	0	0	
17	0	0	0	0	0	0	0	80	80	80	81	81	81	81	81	81	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	84	0	0	0	0	0	0	0	
16	0	0	0	0	0	0	0	80	80	80	81	81	81	81	81	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	
15	0	0	0	0	0	0	0	80	80	80	81	81	81	81	81	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	
14	0	0	0	0	0	0	0	0	80	80	81	81	81	81	81	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	
13	0	0	0	0	0	0	0	0	80	80	81	81	81	81	81	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	
12	0	0	0	0	0	0	0	0	80	80	81	81	81	81	81	82	82	82	82	82	83	83	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	
11	0	0	0	0	0	0	0	0	80	81	81	81	81	81	81	82	82	82	82	82	83	83	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	
10	0	0	0	0	0	0	0	0	80	81	81	81	81	81	81	82	82	82	82	82	83	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	
9	0	0	0	0	0	0	0	0	0	81	81	81	81	81	81	82	82	82	82	82	83	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	
8	0	0	0	0	0	0	0	0	0	81	81	81	81	81	81	82	82	82	82	82	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	0	
7	0	0	0	0	0	0	0	0	0	81	81	81	81	81	81	82	82	82	82	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	0	0	0	0	0	0	0	0	0	81	81	81	81	81	81	82	82	82	82	83	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	0	0	0	0	0	0	0	0	0	0	81	81	81	81	81	82	82	82	82	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	0	81	81	81	81	81	82	0	82	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	0	0	0	0	0	81	81	81	81	81	82	0	82	83	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	0	0	81	81	81	81	82	0	82	83	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1	0	0	0	0	0	0	0	0	0	0	0	0	81	81	81	0	0	0	83	83	83	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
300	0	0	0	0	72	74	75	76	76	77	77	77	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	*
200	0	0	0	71	74	75	76	77	77	77	78	78	78	79	79	79	79	79	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	81	81	*
180	0	0	0	71	74	75	76	77	77	78	78	78	78	79	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	81	81	81	*
160	0	0	0	72	74	75	76	77	77	78	78	78	79	79	79	79	79	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	81	81	81	*
140	0	0	0	72	74	76	76	77	77	78	78	78	79	79	79	79	79	80	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	81	81	*
120	0	0	0	71	74	76	76	77	77	78	78	78	79	79	79	79	79	80	80	80	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	81	*
100	0	0	0	70	74	75	76	77	77	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	*
80	0	0	0	0	74	75	76	77	77	78	78	78	78	79	79	79	79	79	79	79	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	*
60	0	0	0	0	72	74	76	76	77	77	78	78	78	78	78	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	*
40	0	0	0	0	0	72	74	75	76	76	77	77	77	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77	77	77	76	*
20	0	0	0	0	0	0	0	72	74	75	75	76	76	76	76	76	76	76	76	77	77	77	77	77	77	77	76	76	76	76	75	74	72	0	0	0	0	0	0	63
18	0	0	0	0	0	0	0	71	73	74	75	75	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	75	75	74	72	0	0	0	0	0	0	0	63
17	0	0	0	0	0	0	0	70	73	74	75	75	75	76	76	76	76	76	76	76	76	76	76	76	76	76	76	76	75	74	73	70	0	0	0	0	0	0	0	63
16	0	0	0	0	0	0	0	69	73	74	75	75	75	75	76	76	76	76	76	76	76	76	76	76	76	76	76	75	75	74	72	0	0	0	0	0	0	0	0	62
15	0	0	0	0	0	0	0	66	72	74	74	75	75	75	75	75	76	76	76	76	76	76	76	76	76	76	75	75	74	73	70	0	0	0	0	0	0	0	0	62
14	0	0	0	0	0	0	0	0	72	73	74	75	75	75	75	75	75	75	75	76	76	76	76	76	76	75	75	75	74	72	0	0	0	0	0	0	0	0	0	62
13	0	0	0	0	0	0	0	0	71	73	74	74	75	75	75	75	75	75	75	75	76	76	76	76	75	75	75	74	73	70	0	0	0	0	0	0	0	0	0	62
12	0	0	0	0	0	0	0	0	71	73	74	74	75	75	75	75	75	75	75	75	75	75	75	75	75	75	74	74	72	0	0	0	0	0	0	0	0	0	0	61
11	0	0	0	0	0	0	0	0	70	72	73	74	74	75	75	75	74	74	75	75	75	75	75	75	75	74	74	73	70	0	0	0	0	0	0	0	0	0	0	61
10	0	0	0	0	0	0	0	0	68	72	73	74	74	74	74	74	74	74	74	75	75	75	75	75	74	74	73	72	0	0	0	0	0	0	0	0	0	0	0	60
9	0	0	0	0	0	0	0	0	0	71	73	74	74	74	74	74	74	74	74	75	75	75	75	74	74	73	72	68	0	0	0	0	0	0	0	0	0	0	0	60
8	0	0	0	0	0	0	0	0	0	71	72	73	74	74	74	73	73	73	74	74	74	74	74	74	74	73	71	0	0	0	0	0	0	0	0	0	0	0	0	59
7	0	0	0	0	0	0	0	0	0	70	72	73	73	73	73	73	72	73	74	74	74	74	74	74	73	72	0	0	0	0	0	0	0	0	0	0	0	0	0	59
6	0	0	0	0	0	0	0	0	0	67	71	72	73	73	73	72	71	72	73	74	74	74	73	73	72	69	0	0	0	0	0	0	0	0	0	0	0	0	0	58
5	0	0	0	0	0	0	0	0	0	0	70	72	72	73	72	72	69	72	73	73	73	73	73	72	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57
4	0	0	0	0	0	0	0	0	0	0	69	71	72	72	72	71	0	71	72	73	73	73	72	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56
3	0	0	0	0	0	0	0	0	0	0	63	70	71	71	71	69	0	70	71	72	72	72	71	67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55
2	0	0	0	0	0	0	0	0	0	0	0	68	70	70	70	66	0	68	70	71	71	70	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54
1	0	0	0	0	0	0	0	0	0	0	0	0	68	69	67	0	0	0	69	70	69	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-

n(x10^3)

n_c/N_2^+ n_c/N^+

Tab. 3b

50 % N^+, 50 % N_2^+, with squirrel cage

f $(\times 10^3)$	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	-4	-2	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46
300	0	0	0	72	72	72	72	73	73	73	73	73	73	73	74	74	74	74	74	74	74	75	75	75	75	75	75	76	76	76	76	76	76	77	77	77	77	77	77
200	0	0	0	74	74	74	74	75	75	75	75	75	75	76	76	76	76	76	77	77	77	77	77	77	78	78	78	78	78	79	79	79	79	79	79	80	80	80	80
180	0	0	0	74	74	75	75	75	75	75	76	76	76	76	76	77	77	77	77	77	78	78	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80
160	0	0	75	75	75	75	75	76	76	76	76	76	77	77	77	77	77	78	78	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	81	81	81	81
140	0	0	75	75	75	76	76	76	76	76	77	77	77	77	78	78	78	78	78	78	79	79	79	79	79	80	80	80	80	80	80	80	81	81	81	81	81	81	81
120	0	0	76	76	76	76	76	77	77	77	77	78	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	81	81	81	81	81	81	81	81	82	82	82
100	0	0	0	76	77	77	77	77	77	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82
80	0	0	0	77	77	77	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	82	83
60	0	0	0	78	78	78	78	78	79	79	79	79	80	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	82	83	83	83	83	83
40	0	0	0	0	78	79	79	79	79	80	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	83	83	83	83	83	0	0	0	0
20	0	0	0	0	0	0	80	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	80	80	80	80	80	80	81	81	81	81	81	81	82	82	82	82	82	82	82	82	83	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	80	80	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	80	80	80	80	81	81	81	81	81	81	82	82	82	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	80	80	80	80	81	81	81	81	81	81	82	82	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	80	80	80	80	81	81	81	81	81	81	82	82	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	80	80	80	81	81	81	81	81	81	81	82	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	80	80	81	81	81	81	81	81	81	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	80	80	81	81	81	81	81	81	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	80	80	81	81	81	81	81	81	82	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	80	80	81	81	81	81	81	81	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	81	81	81	81	81	81	81	82	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	81	81	81	81	81	81	81	82	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	81	81	81	81	81	81	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	81	81	81	81	81	82	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	81	81	81	81	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

f $(\times 10^3)$	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	-4	-2	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	
300	0	0	0	70	73	74	75	75	76	76	77	77	77	78	78	78	78	78	79	79	79	79	79	79	79	80	80	80	80	80	80	80	80	80	80	81	81	81	81	*
200	0	0	0	73	74	75	76	76	77	77	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	*
180	0	0	0	73	75	75	76	77	77	77	78	78	78	78	79	79	79	79	79	80	80	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	*
160	0	0	66	73	75	76	76	77	77	78	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	81	*
140	0	0	67	73	75	76	76	77	77	78	78	78	78	79	79	79	79	79	80	80	80	80	80	80	80	80	80	80	80	80	81	81	81	81	81	81	81	81	81	*
120	0	0	66	74	75	76	77	77	77	78	78	78	79	79	79	79	79	79	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	*
100	0	0	0	73	75	76	77	77	77	78	78	78	79	79	79	79	79	79	79	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	*
80	0	0	0	73	75	76	76	77	77	78	78	78	78	79	79	79	79	79	79	79	79	79	80	80	80	80	80	80	80	80	80	80	80	79	79	79	79	79	79	*
60	0	0	0	71	74	75	76	77	77	77	78	78	78	78	78	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	78	78	78	78	77	77	*
40	0	0	0	0	72	74	75	76	77	77	77	77	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	78	77	77	77	77	76	75	74	0	0	0	0	66
20	0	0	0	0	0	0	73	74	75	76	76	76	76	77	77	77	77	77	77	77	77	76	76	76	75	74	73	0	0	0	0	0	0	0	0	0	0	0	0	63
18	0	0	0	0	0	0	72	74	75	75	76	76	76	76	76	77	77	77	76	76	76	76	76	75	74	73	67	0	0	0	0	0	0	0	0	0	0	0	0	62
17	0	0	0	0	0	0	71	74	75	75	76	76	76	76	76	76	76	76	76	76	76	76	75	75	74	72	0	0	0	0	0	0	0	0	0	0	0	0	0	62
16	0	0	0	0	0	0	70	73	74	75	75	76	76	76	76	76	76	76	76	76	76	75	75	74	73	69	0	0	0	0	0	0	0	0	0	0	0	0	0	62
15	0	0	0	0	0	0	69	73	74	75	75	76	76	76	76	76	76	76	76	76	76	75	75	74	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61
14	0	0	0	0	0	0	0	73	74	75	75	76	76	76	76	76	76	76	76	76	75	75	74	73	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61
13	0	0	0	0	0	0	0	72	74	74	75	75	76	76	76	76	76	76	76	75	75	74	74	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61
12	0	0	0	0	0	0	0	71	73	74	75	75	75	76	76	76	76	76	75	75	75	74	73	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
11	0	0	0	0	0	0	0	70	73	74	75	75	75	75	76	76	75	75	75	75	74	73	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
10	0	0	0	0	0	0	0	69	73	74	74	75	75	75	75	75	75	75	75	74	74	72	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
9	0	0	0	0	0	0	0	0	72	73	74	75	75	75	75	75	75	75	74	74	73	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59
8	0	0	0	0	0	0	0	0	71	73	74	74	75	75	75	75	75	74	74	73	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59
7	0	0	0	0	0	0	0	0	70	72	73	74	74	74	75	75	74	74	73	72	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58
6	0	0	0	0	0	0	0	0	66	72	73	74	74	74	74	74	74	73	73	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57
5	0	0	0	0	0	0	0	0	0	71	72	73	74	74	74	74	73	73	72	65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57
4	0	0	0	0	0	0	0	0	0	69	72	73	73	73	73	73	73	72	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56
3	0	0	0	0	0	0	0	0	0	0	70	72	72	73	73	72	72	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54
2	0	0	0	0	0	0	0	0	0	0	67	71	72	72	72	71	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53
1	0	0	0	0	0	0	0	0	0	0	0	68	70	70	70	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-

n $(\times 10^3)$

↑ n_c

Tab. 3c

100 % N_2^+, with squirrel cage

$f\,(\times 10^{2})$	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
87	0	0	0	0	70	71	71	71	71	72	72	72	73	73	73	73	74	74	74	75	75	76	76	76	77	77	78	78	78	79	79	80	80	81	81	81	82	82	82
84	0	0	0	0	71	71	71	71	72	72	72	73	73	73	73	74	74	74	75	75	76	76	76	77	77	78	78	78	79	79	80	80	81	81	81	82	82	83	83
81	0	0	0	0	71	71	71	72	72	72	72	73	73	73	74	74	74	75	75	76	76	76	77	77	78	78	78	79	79	80	80	81	81	81	82	82	83	83	83
78	0	0	0	0	71	71	72	72	72	72	73	73	73	74	74	74	75	75	75	76	76	77	77	78	78	78	79	79	80	80	81	81	81	82	82	83	83	83	84
75	0	0	0	0	71	71	72	72	72	73	73	73	74	74	74	75	75	75	76	76	77	77	78	78	78	79	79	80	80	81	81	82	82	82	83	83	83	84	84
72	0	0	0	0	71	72	72	72	73	73	73	74	74	74	75	75	75	76	76	77	77	78	78	78	79	79	80	80	81	81	82	82	82	83	83	83	84	84	84
69	0	0	0	0	72	72	72	72	73	73	73	74	74	75	75	75	76	76	77	77	78	78	78	79	79	80	80	81	81	82	82	82	83	83	83	84	84	84	85
66	0	0	0	0	72	72	72	73	73	73	74	74	74	75	75	76	76	77	77	78	78	78	79	79	80	80	81	81	82	82	82	83	83	84	84	84	84	85	85
63	0	0	0	0	72	72	73	73	73	74	74	74	75	75	76	76	77	77	78	78	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	85
60	0	0	0	0	72	72	73	73	74	74	74	75	75	76	76	77	77	77	78	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	85	86
57	0	0	0	0	72	73	73	73	74	74	75	75	76	76	77	77	77	78	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	85	86	86
54	0	0	0	0	73	73	73	74	74	75	75	76	76	76	77	77	78	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	85	86	86	86
51	0	0	0	0	73	73	74	74	75	75	75	76	76	77	77	78	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	86	86	86
48	0	0	0	0	73	74	74	74	75	75	76	76	77	77	78	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	86	86	87	0
45	0	0	0	0	73	74	74	75	75	76	76	77	77	78	78	79	79	80	81	81	81	82	82	83	83	84	84	84	85	85	85	85	86	86	86	86	0	0	0
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39	0	0	0	0	74	75	75	76	76	77	77	78	78	79	79	80	81	81	82	82	82	83	83	84	84	84	85	85	85	85	86	86	86	0	0	0	0	0	0
36	0	0	0	0	74	75	75	76	77	77	78	78	79	79	80	81	81	82	82	82	83	83	84	84	84	85	85	85	85	86	86	86	0	0	0	0	0	0	0
33	0	0	0	0	75	75	76	76	77	78	78	79	79	80	81	81	82	82	82	83	83	84	84	84	85	85	85	86	86	86	0	0	0	0	0	0	0	0	0
30	0	0	0	0	75	76	76	77	78	78	79	79	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	86	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	76	76	77	77	78	79	79	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	76	77	77	78	79	79	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	76	77	78	79	79	80	81	81	82	82	83	83	83	84	84	85	85	85	85	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	77	78	78	79	80	80	81	82	82	83	83	83	84	84	85	85	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	78	78	79	80	80	81	82	82	83	83	84	84	84	85	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	78	79	80	80	81	82	82	83	83	84	84	84	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	79	80	80	81	82	82	83	83	84	84	84	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	80	81	82	82	83	83	84	84	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	81	82	82	83	83	84	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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$f\,(\times 10^{2})$	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	$n\,(\times 10^{2})$
87	0	0	0	0	74	76	77	78	79	79	79	80	80	80	81	81	81	81	82	82	82	82	83	83	83	83	83	83	84	84	84	84	84	84	84	85	85	85	85	*
84	0	0	0	0	74	76	77	78	79	79	80	80	80	81	81	81	81	82	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	85	85	85	85	85	*
81	0	0	0	0	75	76	77	78	79	79	80	80	80	81	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	85	85	85	85	85	85	*
78	0	0	0	0	75	76	78	78	79	79	80	80	80	81	81	81	82	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	85	85	85	85	85	85	*
75	0	0	0	0	75	77	78	78	79	79	80	80	81	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	85	85	85	85	85	85	85	*
72	0	0	0	0	75	77	78	78	79	79	80	80	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	85	85	85	85	85	85	85	*
69	0	0	0	0	75	77	78	79	79	80	80	80	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	85	85	85	85	85	85	84	*
66	0	0	0	0	75	77	78	79	79	80	80	81	81	81	81	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	85	85	84	84	84	84	*
63	0	0	0	0	75	77	78	79	79	80	80	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	*
60	0	0	0	0	75	77	78	79	79	80	80	81	81	81	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	*
57	0	0	0	0	75	77	78	79	80	80	80	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	*
54	0	0	0	0	75	77	78	79	80	80	81	81	81	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	83	82	*
51	0	0	0	0	75	77	78	79	80	80	81	81	81	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	82	82	80	*
48	0	0	0	0	75	77	79	79	80	80	81	81	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	83	83	83	82	81	79	0	78
45	0	0	0	0	76	78	79	79	80	81	81	81	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	83	83	83	82	82	80	0	0	0	78
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21	0	0	0	0	76	78	80	80	81	81	82	82	82	82	82	82	82	82	82	82	82	81	80	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
18	0	0	0	0	76	78	80	80	81	81	82	82	82	82	82	82	82	82	81	81	80	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74
15	0	0	0	0	75	78	80	80	81	81	82	82	82	82	82	82	81	81	80	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73
12	0	0	0	0	75	78	80	80	81	81	81	81	81	81	81	81	80	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72
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6	0	0	0	0	0	77	79	79	80	80	80	80	79	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69
3	0	0	0	0	0	74	77	78	79	78	78	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-

n_c

Tab. 4a

100 % N^{+}, without squirrel cage

$f(\times 10^2)$	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	$n(\times 10^2)$
87	0	0	0	0	70	70	71	71	71	71	72	72	72	73	73	73	74	74	74	75	75	75	76	76	77	77	77	78	78	79	79	80	80	80	81	81	82	82	82	
84	0	0	0	0	70	71	71	71	71	72	72	72	73	73	73	73	74	74	75	75	75	76	76	76	77	77	78	78	79	79	80	80	80	81	81	82	82	82	83	
81	0	0	0	0	71	71	71	71	72	72	72	72	73	73	73	74	74	75	75	75	76	76	76	77	77	78	78	79	79	80	80	80	81	81	82	82	82	83	83	
78	0	0	0	0	71	71	71	72	72	72	72	73	73	73	74	74	74	75	75	76	76	76	77	77	78	78	79	79	80	80	80	81	81	82	82	83	83	83	84	
75	0	0	0	0	71	71	71	72	72	72	73	73	73	74	74	74	75	75	76	76	76	77	77	78	78	79	79	80	80	81	81	81	82	82	83	83	83	84	84	
72	0	0	0	0	71	71	72	72	72	73	73	73	74	74	74	75	75	76	76	76	77	77	78	78	79	79	80	80	81	81	81	82	82	83	83	83	84	84	84	
69	0	0	0	0	71	72	72	72	72	73	73	74	74	74	75	75	76	76	76	77	77	78	78	79	79	80	80	81	81	81	82	82	83	83	83	84	84	84	85	
66	0	0	0	0	71	72	72	72	73	73	73	74	74	75	75	75	76	76	77	77	78	78	79	79	80	80	81	81	82	82	82	83	83	83	84	84	84	85	85	
63	0	0	0	0	72	72	72	73	73	73	74	74	75	75	75	76	76	77	77	78	78	79	79	80	80	81	81	82	82	82	83	83	84	84	84	84	85	85	85	
60	0	0	0	0	72	72	73	73	73	74	74	75	75	75	76	76	77	77	78	78	79	79	80	80	81	81	82	82	82	83	83	84	84	84	85	85	85	85	86	
57	0	0	0	0	72	72	73	73	74	74	74	75	75	76	76	77	77	78	78	79	79	80	80	81	81	82	82	82	83	83	84	84	84	85	85	85	85	86	86	
54	0	0	0	0	72	73	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	85	86	86	86	
51	0	0	0	0	73	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	85	86	86	86	86	
48	0	0	0	0	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	86	86	86	0	
45	0	0	0	0	73	74	74	74	75	75	76	77	77	78	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	86	86	0	0	0	
42	0	0	0	0	73	74	74	75	75	76	76	77	78	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	86	86	0	0	0	0	
39	0	0	0	0	74	74	75	75	76	76	77	78	78	79	79	80	80	81	81	82	82	83	83	84	84	84	85	85	85	85	86	86	86	0	0	0	0	0	0	
36	0	0	0	0	74	75	75	76	76	77	78	78	79	79	80	80	81	81	82	82	83	83	84	84	84	85	85	85	85	86	86	86	0	0	0	0	0	0	0	
33	0	0	0	0	74	75	76	76	77	77	78	79	79	80	80	81	81	82	82	83	83	84	84	84	85	85	85	85	86	86	0	0	0	0	0	0	0	0	0	
30	0	0	0	0	75	75	76	77	77	78	79	79	80	80	81	81	82	82	83	83	84	84	84	85	85	85	86	86	0	0	0	0	0	0	0	0	0	0	0	
27	0	0	0	0	75	76	77	77	78	79	79	80	80	81	82	82	82	83	83	84	84	84	85	85	85	86	86	0	0	0	0	0	0	0	0	0	0	0	0	
24	0	0	0	0	76	76	77	78	78	79	80	80	81	82	82	82	83	83	84	84	84	85	85	85	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
21	0	0	0	0	76	77	78	78	79	80	80	81	82	82	83	83	83	84	84	84	85	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
18	0	0	0	0	77	78	78	79	80	80	81	82	82	83	83	83	84	84	85	85	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15	0	0	0	0	77	78	79	80	80	81	82	82	83	83	83	84	84	85	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	0	0	0	0	78	79	80	80	81	82	82	83	83	83	84	84	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	0	0	0	0	79	79	80	81	82	82	83	83	84	84	84	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	0	0	0	0	0	80	81	81	82	83	83	84	84	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	81	81	82	83	83	84	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
87	0	0	0	0	74	76	77	78	78	79	79	80	80	80	81	81	81	81	82	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	85	85	85	85	*
84	0	0	0	0	74	76	77	78	79	79	79	80	80	80	81	81	81	81	82	82	82	82	83	83	83	83	83	83	84	84	84	84	84	84	84	85	85	85	85	*
81	0	0	0	0	74	76	77	78	79	79	79	80	80	80	81	81	81	82	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	85	85	85	85	85	*
78	0	0	0	0	75	76	77	78	79	79	80	80	80	81	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	85	85	85	85	85	*
75	0	0	0	0	75	76	77	78	79	79	80	80	80	81	81	81	82	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	85	85	85	85	85	*
72	0	0	0	0	75	77	78	78	79	79	80	80	80	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	85	85	85	85	85	*
69	0	0	0	0	75	77	78	78	79	79	80	80	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	85	85	84	84	84	*
66	0	0	0	0	75	77	78	78	79	80	80	80	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	*
63	0	0	0	0	75	77	78	79	79	80	80	80	81	81	81	82	82	82	83	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	*
60	0	0	0	0	75	77	78	79	79	80	80	81	81	81	82	82	82	82	83	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	*
57	0	0	0	0	75	77	78	79	79	80	80	81	81	81	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	*
54	0	0	0	0	75	77	78	79	80	80	80	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	83	82	*
51	0	0	0	0	75	77	78	79	80	80	81	81	81	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	83	83	83	82	81	80	*
48	0	0	0	0	75	77	78	79	80	80	81	81	81	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	83	83	83	82	82	81	77	0	78
45	0	0	0	0	75	77	79	79	80	80	81	81	82	82	82	83	83	83	83	83	83	84	84	84	84	84	84	84	84	83	83	83	83	82	81	79	0	0	0	78
42	0	0	0	0	76	78	79	79	80	81	81	81	82	82	82	83	83	83	83	83	83	84	84	84	84	84	84	83	83	83	83	82	82	80	76	0	0	0	0	78
39	0	0	0	0	76	78	79	80	80	81	81	82	82	82	82	83	83	83	83	83	83	84	84	84	83	83	83	83	83	82	82	81	79	0	0	0	0	0	0	77
36	0	0	0	0	76	78	79	80	80	81	81	82	82	82	83	83	83	83	83	83	83	83	83	83	83	83	83	82	82	81	80	72	0	0	0	0	0	0	0	77
33	0	0	0	0	76	78	79	80	80	81	81	82	82	82	83	83	83	83	83	83	83	83	83	83	83	83	82	82	81	78	0	0	0	0	0	0	0	0	0	77
30	0	0	0	0	76	78	79	80	81	81	82	82	82	82	83	83	83	83	83	83	83	83	83	83	82	82	81	79	0	0	0	0	0	0	0	0	0	0	0	76
27	0	0	0	0	76	78	79	80	81	81	82	82	82	82	83	83	83	83	83	83	83	82	82	82	81	80	76	0	0	0	0	0	0	0	0	0	0	0	0	76
24	0	0	0	0	76	78	79	80	81	81	82	82	82	82	83	83	83	83	83	82	82	82	81	80	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
21	0	0	0	0	76	78	80	80	81	81	82	82	82	82	82	82	82	82	82	82	81	81	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
18	0	0	0	0	76	78	80	80	81	81	82	82	82	82	82	82	82	82	81	81	80	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74
15	0	0	0	0	76	78	80	80	81	81	82	82	82	82	82	81	81	81	80	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73
12	0	0	0	0	75	78	80	80	81	81	81	81	81	81	81	80	80	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72
9	0	0	0	0	73	78	79	80	80	81	81	81	81	80	79	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	71
6	0	0	0	0	0	77	79	79	80	80	80	80	79	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69
3	0	0	0	0	0	74	77	78	79	78	78	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–

n_c/O^+ n_c/N^+

Tab. 4b

50 % N^+, 50 % O^+, without squirrel cage

f ($\times 10^2$)	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
87	0	0	0	0	70	70	70	71	71	71	71	72	72	72	73	73	73	74	74	74	75	75	75	76	76	77	77	78	78	78	79	79	80	80	81	81	81	82	82
84	0	0	0	0	70	70	71	71	71	71	72	72	72	73	73	73	74	74	74	75	75	75	76	76	77	77	78	78	78	79	79	80	80	81	81	82	82	82	83
81	0	0	0	0	70	70	71	71	71	72	72	72	73	73	73	74	74	74	75	75	75	76	76	77	77	78	78	78	79	79	80	80	81	81	82	82	82	83	83
78	0	0	0	0	70	71	71	71	72	72	72	72	73	73	73	74	74	75	75	75	76	76	77	77	78	78	78	79	79	80	80	81	81	82	82	82	83	83	83
75	0	0	0	0	71	71	71	71	72	72	72	73	73	73	74	74	75	75	75	76	76	77	77	78	78	79	79	79	80	80	81	81	82	82	82	83	83	84	84
72	0	0	0	0	71	71	71	72	72	72	73	73	73	74	74	74	75	75	76	76	77	77	78	78	79	79	79	80	80	81	81	82	82	83	83	83	84	84	84
69	0	0	0	0	71	71	72	72	72	73	73	73	74	74	74	75	75	76	76	77	77	78	78	79	79	80	80	80	81	81	82	82	83	83	83	84	84	84	85
66	0	0	0	0	71	71	72	72	72	73	73	74	74	74	75	75	76	76	77	77	78	78	79	79	80	80	80	81	81	82	82	83	83	83	84	84	84	85	85
63	0	0	0	0	71	72	72	72	73	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80	80	81	81	81	82	82	83	83	83	84	84	84	85	85	85
60	0	0	0	0	72	72	72	73	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80	80	81	81	81	82	82	83	83	83	84	84	84	85	85	85	86
57	0	0	0	0	72	72	73	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80	80	81	81	82	82	82	83	83	84	84	84	84	85	85	85	86	86
54	0	0	0	0	72	72	73	73	74	74	75	75	75	76	76	77	78	78	79	79	80	80	81	81	82	82	82	83	83	84	84	84	85	85	85	85	86	86	86
51	0	0	0	0	72	73	73	74	74	74	75	75	76	76	77	77	78	79	79	80	80	81	81	82	82	82	83	83	84	84	84	85	85	85	85	86	86	86	86
48	0	0	0	0	73	73	73	74	74	75	75	76	76	77	77	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	85	86	86	86	0	0
45	0	0	0	0	73	73	74	74	75	75	76	76	77	77	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	86	86	0	0	0
42	0	0	0	0	73	74	74	75	75	76	76	77	77	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	86	0	0	0	0	0
39	0	0	0	0	73	74	74	75	76	76	77	77	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	86	0	0	0	0	0	0
36	0	0	0	0	74	74	75	75	76	77	77	78	79	79	80	80	81	81	82	82	83	83	83	84	84	85	85	85	85	86	86	0	0	0	0	0	0	0	0
33	0	0	0	0	74	75	75	76	77	77	78	78	79	80	80	81	81	82	82	83	83	84	84	84	85	85	85	85	86	86	0	0	0	0	0	0	0	0	0
30	0	0	0	0	75	75	76	76	77	78	78	79	80	80	81	81	82	82	83	83	84	84	84	85	85	85	85	86	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	75	76	76	77	78	78	79	80	80	81	81	82	82	83	83	84	84	84	85	85	85	86	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	75	76	77	78	78	79	80	80	81	81	82	82	83	83	84	84	84	85	85	85	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	76	77	77	78	79	80	80	81	81	82	82	83	83	84	84	84	85	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	77	77	78	79	80	80	81	81	82	82	83	83	84	84	84	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	77	78	79	79	80	81	81	82	82	83	83	84	84	84	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	78	79	79	80	81	81	82	83	83	83	84	84	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	78	79	80	81	81	82	83	83	83	84	84	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	80	81	81	82	83	83	83	84	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	81	81	82	83	83	83	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

f ($\times 10^2$)	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	n ($\times 10^2$)
87	0	0	0	0	74	76	77	78	78	79	79	80	80	80	80	81	81	81	81	82	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	85	85	85	*
84	0	0	0	0	74	76	77	78	78	79	79	80	80	80	81	81	81	81	82	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	85	85	85	*
81	0	0	0	0	74	76	77	78	78	79	79	80	80	80	81	81	81	81	82	82	82	82	83	83	83	83	83	83	84	84	84	84	84	84	84	85	85	85	85	*
78	0	0	0	0	74	76	77	78	79	79	79	80	80	80	81	81	81	82	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	85	85	85	85	*
75	0	0	0	0	74	76	77	78	79	79	80	80	80	81	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	85	85	85	85	*
72	0	0	0	0	75	76	77	78	79	79	80	80	80	81	81	81	82	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	*
69	0	0	0	0	75	76	78	78	79	79	80	80	80	81	81	81	82	82	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	*
66	0	0	0	0	75	77	78	78	79	79	80	80	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	*
63	0	0	0	0	75	77	78	78	79	80	80	80	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	*
60	0	0	0	0	75	77	78	79	79	80	80	80	81	81	81	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	*
57	0	0	0	0	75	77	78	79	79	80	80	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	83	*
54	0	0	0	0	75	77	78	79	79	80	80	81	81	81	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	83	83	83	82	82	82	*
51	0	0	0	0	75	77	78	79	80	80	80	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	83	83	83	83	82	81	78	*
48	0	0	0	0	75	77	78	79	80	80	81	81	81	82	82	82	83	83	83	83	83	83	84	84	84	84	84	84	84	84	83	83	83	83	82	81	80	0	0	78
45	0	0	0	0	75	77	78	79	80	80	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	83	83	83	83	82	82	81	78	0	0	0	78
42	0	0	0	0	75	77	79	79	80	80	81	81	82	82	82	83	83	83	83	83	83	83	84	84	84	84	83	83	83	83	83	82	81	80	0	0	0	0	0	77
39	0	0	0	0	76	78	79	79	80	81	81	81	82	82	82	83	83	83	83	83	83	83	83	83	83	83	83	83	83	82	82	80	77	0	0	0	0	0	0	77
36	0	0	0	0	76	78	79	80	80	81	81	82	82	82	82	83	83	83	83	83	83	83	83	83	83	83	82	82	81	79	0	0	0	0	0	0	0	0	0	77
33	0	0	0	0	76	78	79	80	80	81	81	82	82	82	83	83	83	83	83	83	83	83	83	83	83	82	82	81	80	76	0	0	0	0	0	0	0	0	0	76
30	0	0	0	0	76	78	79	80	81	81	81	82	82	82	83	83	83	83	83	83	83	83	83	83	82	82	81	81	78	0	0	0	0	0	0	0	0	0	0	76
27	0	0	0	0	76	78	79	80	81	81	82	82	82	82	83	83	83	83	83	83	83	83	82	82	82	81	79	0	0	0	0	0	0	0	0	0	0	0	0	75
24	0	0	0	0	76	78	79	80	81	81	82	82	82	82	82	83	83	83	82	82	82	82	81	80	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
21	0	0	0	0	76	78	79	80	81	81	82	82	82	82	82	82	82	82	82	82	81	80	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74
18	0	0	0	0	76	78	80	80	81	81	82	82	82	82	82	82	82	82	81	80	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74
15	0	0	0	0	76	78	80	80	81	81	81	82	82	82	82	81	81	80	79	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73
12	0	0	0	0	75	78	80	80	81	81	81	81	81	81	81	80	79	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72
9	0	0	0	0	73	78	79	80	80	81	81	81	80	80	79	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	71
6	0	0	0	0	0	77	79	79	80	80	80	79	79	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69
3	0	0	0	0	0	75	77	78	78	78	77	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–

n_c'

Tab. 4c

100 % O^+, without squirrel cage

f(x10^2)	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
87	0	70	70	71	71	71	72	72	72	72	73	73	73	74	74	74	75	75	75	76	76	77	77	77	78	78	79	79	80	80	81	81	81	82	82	83	83	83	84
84	0	70	71	71	71	71	72	72	72	73	73	73	74	74	74	75	75	75	76	76	77	77	77	78	78	79	79	80	80	81	81	81	82	82	83	83	83	84	84
81	0	71	71	71	71	72	72	72	73	73	73	74	74	74	75	75	75	76	76	77	77	77	78	78	79	79	80	80	81	81	81	82	82	83	83	83	84	84	84
78	0	71	71	71	72	72	72	72	73	73	73	74	74	75	75	75	76	76	77	77	77	78	78	79	79	80	80	81	81	81	82	82	83	83	83	84	84	84	85
75	0	71	71	71	72	72	72	73	73	73	74	74	74	75	75	76	76	77	77	77	78	78	79	79	80	80	81	81	82	82	82	83	83	83	84	84	84	85	85
72	0	71	71	72	72	72	73	73	73	74	74	74	75	75	76	76	77	77	77	78	78	79	79	80	80	81	81	82	82	82	83	83	83	84	84	84	85	85	85
69	0	71	72	72	72	73	73	73	74	74	74	75	75	76	76	77	77	77	78	78	79	79	80	80	81	81	82	82	82	83	83	84	84	84	84	85	85	85	86
66	0	71	72	72	72	73	73	74	74	74	75	75	76	76	77	77	77	78	78	79	79	80	80	81	81	82	82	82	83	83	84	84	84	85	85	85	85	86	86
63	0	72	72	72	73	73	73	74	74	75	75	76	76	76	77	77	78	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	85	86	86	86
60	0	72	72	73	73	73	74	74	75	75	76	76	76	77	77	78	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	85	86	86	86	86
57	0	72	73	73	73	74	74	75	75	75	76	76	77	77	78	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	85	86	86	86	86	87
54	0	72	73	73	74	74	74	75	75	76	76	77	77	78	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	86	86	86	0	0
51	0	73	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	86	86	87	0	0	0
48	0	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80	81	81	81	82	82	83	83	84	84	84	85	85	85	85	86	86	86	86	0	0	0	0	0
45	0	73	74	74	75	75	76	76	77	77	78	78	79	80	80	81	81	82	82	82	83	83	84	84	84	85	85	85	85	86	86	86	86	0	0	0	0	0	0
42	0	74	74	75	75	76	76	77	77	78	78	79	80	80	81	81	82	82	82	83	83	84	84	84	85	85	85	85	86	86	86	0	0	0	0	0	0	0	0
39	0	74	74	75	75	76	77	77	78	78	79	80	80	81	81	82	82	82	83	83	84	84	84	85	85	85	86	86	86	86	0	0	0	0	0	0	0	0	0
36	0	74	75	75	76	77	77	78	78	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	86	0	0	0	0	0	0	0	0	0	0	0
33	0	75	75	76	76	77	78	78	79	79	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	86	0	0	0	0	0	0	0	0	0	0	0	0
30	0	75	76	76	77	78	78	79	79	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	75	76	77	77	78	79	79	80	81	81	82	82	83	83	83	84	84	85	85	85	85	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	76	77	77	78	79	79	80	81	81	82	82	83	83	84	84	84	85	85	85	85	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	76	77	78	79	79	80	81	81	82	82	83	83	84	84	84	85	85	85	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	77	78	79	79	80	81	81	82	82	83	83	84	84	84	85	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	78	78	79	80	81	81	82	82	83	83	84	84	84	85	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	78	79	80	81	81	82	82	83	83	84	84	84	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	79	80	81	81	82	82	83	83	84	84	84	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	80	81	82	82	83	83	84	84	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	81	82	82	83	83	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

f(x10^2)	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	n(x10^2)
87	0	74	76	77	78	78	79	79	80	80	80	81	81	81	81	82	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	85	85	85	85	85	85	85	*
84	0	74	76	77	78	79	79	79	80	80	80	81	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	85	85	85	85	85	85	85	*
81	0	74	76	77	78	79	79	79	80	80	81	81	81	81	82	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	85	85	85	85	85	85	85	85	*
78	0	74	76	77	78	79	79	80	80	80	81	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	85	85	85	85	85	85	85	85	*
75	0	74	76	77	78	79	79	80	80	80	81	81	81	82	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	85	85	85	85	85	85	85	84	*
72	0	74	76	77	78	79	79	80	80	80	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	85	85	85	85	84	84	84	84	*
69	0	74	76	77	78	79	79	80	80	81	81	81	82	82	82	82	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	*
66	0	73	76	77	78	79	79	80	80	81	81	81	82	82	82	82	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	*
63	0	73	76	78	78	79	80	80	80	81	81	81	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	*
60	0	73	76	78	78	79	80	80	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	82	82	*
57	0	73	76	78	79	79	80	80	81	81	81	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	83	82	81	78	*
54	0	73	77	78	79	79	80	80	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	83	83	83	82	81	80	0	0	79
51	0	73	77	78	79	80	80	81	81	81	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	83	83	82	82	81	78	0	0	0	78
48	0	73	77	78	79	80	80	81	81	81	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	83	83	83	82	81	80	0	0	0	0	78
45	0	73	77	78	79	80	80	81	81	82	82	82	83	83	83	83	83	83	84	84	84	84	84	84	84	84	84	83	83	83	83	82	82	81	77	0	0	0	0	78
42	0	74	77	78	79	80	80	81	81	82	82	82	83	83	83	83	83	83	84	84	84	84	84	84	84	83	83	83	83	82	82	81	79	0	0	0	0	0	0	77
39	0	74	77	79	79	80	81	81	82	82	82	82	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	82	81	80	76	0	0	0	0	0	0	0	0	77
36	0	74	77	79	80	80	81	81	82	82	82	83	83	83	83	83	83	83	83	83	83	83	83	83	83	82	82	81	79	0	0	0	0	0	0	0	0	0	0	77
33	0	74	77	79	80	80	81	81	82	82	82	83	83	83	83	83	83	83	83	83	83	83	82	82	81	80	72	0	0	0	0	0	0	0	0	0	0	0	0	76
30	0	74	78	79	80	81	81	82	82	82	82	83	83	83	83	83	83	83	83	83	82	82	81	80	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76
27	0	75	78	79	80	81	81	82	82	82	82	83	83	83	83	83	83	83	82	82	82	81	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
24	0	75	78	79	80	81	81	82	82	82	82	83	83	83	83	82	82	82	82	81	80	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
21	0	75	78	79	80	81	81	82	82	82	82	82	82	82	82	82	82	81	80	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74
18	0	75	78	80	80	81	81	82	82	82	82	82	82	82	82	81	80	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74
15	0	75	78	80	80	81	81	81	82	82	82	82	81	81	80	79	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73
12	0	75	78	80	80	81	81	81	81	81	81	81	80	79	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72
9	0	73	78	79	80	80	81	81	81	80	80	79	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	71
6	0	0	77	79	79	80	80	80	79	78	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69
3	0	0	75	78	78	78	78	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-

n_c

Tab. 5a

100 % N^+, with squirrel cage

f ($\times10^2$)	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
87	0	70	70	70	71	71	71	72	72	72	72	73	73	73	74	74	74	75	75	76	76	76	77	77	78	78	79	79	79	80	80	81	81	82	82	82	83	83	83
84	0	70	70	71	71	71	71	72	72	72	73	73	73	74	74	74	75	75	76	76	76	77	77	78	78	79	79	80	80	80	81	81	82	82	82	83	83	84	84
81	0	70	71	71	71	71	72	72	72	73	73	73	74	74	74	75	75	76	76	76	77	77	78	78	79	79	80	80	80	81	81	82	82	83	83	83	84	84	84
78	0	70	71	71	71	72	72	72	73	73	73	74	74	74	75	75	75	76	76	77	77	78	78	79	79	80	80	80	81	81	82	82	83	83	83	84	84	84	85
75	0	71	71	71	71	72	72	72	73	73	73	74	74	75	75	75	76	75	77	77	78	78	79	79	80	80	81	81	81	82	82	83	83	83	84	84	84	85	85
72	0	71	71	71	72	72	72	73	73	73	74	74	75	75	75	76	76	77	77	78	78	79	79	80	80	81	81	81	82	82	83	83	83	84	84	84	85	85	85
69	0	71	71	72	72	72	73	73	73	74	74	75	75	75	76	76	77	77	78	78	79	79	80	80	81	81	82	82	82	83	83	83	84	84	84	85	85	85	86
66	0	71	72	72	72	73	73	73	74	74	74	75	75	76	76	77	77	78	78	79	79	80	80	81	81	82	82	82	83	83	83	84	84	84	85	85	85	86	86
63	0	71	72	72	72	73	73	74	74	74	75	75	76	76	77	77	78	78	79	79	80	80	81	81	82	82	82	83	83	84	84	84	85	85	85	85	86	86	86
60	0	72	72	72	73	73	74	74	74	75	75	76	76	77	77	78	78	79	79	80	80	81	81	82	82	82	83	83	84	84	84	85	85	35	85	86	86	86	86
57	0	72	72	73	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	85	86	86	86	86	0
54	0	72	73	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	85	86	86	86	86	0	0
51	0	72	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	86	86	0	0	0	0
48	0	73	73	74	74	74	75	75	76	77	77	78	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	86	86	0	0	0	0	0
45	0	73	73	74	74	75	75	76	77	77	78	78	79	79	80	80	81	81	82	82	83	83	84	84	84	85	85	85	85	86	86	86	0	0	0	0	0	0	0
42	0	73	74	74	75	75	76	76	77	78	78	79	79	80	80	81	81	82	82	83	83	84	84	84	85	85	85	85	86	86	86	0	0	0	0	0	0	0	0
39	0	74	74	75	75	76	76	77	78	78	79	79	80	80	81	81	82	82	83	83	84	84	84	85	85	85	85	86	86	0	0	0	0	0	0	0	0	0	0
36	0	74	75	75	76	76	77	78	78	79	79	80	80	81	82	82	82	83	83	84	84	84	85	85	85	86	86	86	0	0	0	0	0	0	0	0	0	0	0
33	0	74	75	76	76	77	77	78	79	79	80	80	81	82	82	82	83	83	84	84	84	85	85	85	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	75	75	76	77	77	78	79	79	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	75	76	77	77	78	79	79	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	76	76	77	78	79	79	80	81	81	82	82	83	83	83	84	84	85	85	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	76	77	78	78	79	80	81	81	82	82	83	83	83	84	84	85	85	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	77	78	78	79	80	81	81	82	82	83	83	84	84	84	85	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	77	78	79	80	80	81	82	82	83	83	84	84	84	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	78	79	80	80	81	82	82	83	83	84	84	84	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	79	80	80	81	82	32	83	83	84	84	84	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	80	81	82	82	83	83	84	84	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	81	82	82	83	83	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

f ($\times10^2$)	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	n ($\times10^2$)
87	0	71	75	76	77	78	79	79	79	80	80	80	81	81	81	81	82	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	85	85	85	85	85	85	*
84	0	71	75	77	77	78	79	79	79	80	80	80	81	81	81	82	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	85	85	85	85	85	85	*
81	0	70	75	77	78	78	79	79	80	80	80	81	81	81	81	82	82	82	82	83	83	83	83	83	83	84	84	84	84	84	84	84	84	85	85	85	85	85	85	*
78	0	70	75	77	78	78	79	79	80	80	80	81	81	81	82	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	85	85	85	85	85	85	84	*
75	0	69	75	77	78	78	79	79	80	80	80	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	85	85	85	84	84	84	*
72	0	69	75	77	78	78	79	79	80	80	81	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	*
69	0	69	75	77	78	79	79	80	80	80	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	*
66	0	69	75	77	78	79	79	80	80	80	81	81	81	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	*
63	0	69	76	77	78	79	79	80	80	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	82	*
60	0	69	76	77	78	79	79	80	80	81	81	81	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	83	82	81	*
57	0	70	76	77	78	79	80	80	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	82	82	80	0	79
54	0	70	76	77	78	79	80	80	81	81	81	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	83	83	83	82	81	79	0	0	78
51	0	70	76	78	79	79	80	80	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	83	83	83	82	82	80	0	0	0	0	78
48	0	71	76	78	79	79	80	81	81	81	82	82	82	83	83	83	83	83	83	84	84	84	84	84	84	84	84	83	83	83	82	82	81	79	0	0	0	0	0	78
45	0	72	76	78	79	80	80	81	81	81	82	82	82	83	83	83	83	83	83	84	84	84	84	84	84	83	83	83	83	82	81	80	0	0	0	0	0	0	0	78
42	0	72	77	78	79	80	80	81	81	82	82	82	83	83	83	83	83	83	83	84	84	84	83	83	83	83	83	82	82	81	78	0	0	0	0	0	0	0	0	77
39	0	73	77	78	79	80	81	81	81	82	82	82	83	83	83	83	83	83	83	83	83	83	83	83	83	82	82	81	80	0	0	0	0	0	0	0	0	0	0	77
36	0	73	77	78	79	80	81	81	82	82	82	82	83	83	83	83	83	83	83	83	83	83	83	82	82	81	80	77	0	0	0	0	0	0	0	0	0	0	0	77
33	0	73	77	79	80	80	81	81	82	82	82	83	83	83	83	83	83	83	83	83	83	83	82	82	81	79	0	0	0	0	0	0	0	0	0	0	0	0	0	76
30	0	74	77	79	80	80	81	81	82	82	82	83	83	83	83	83	83	83	83	83	82	82	81	80	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76
27	0	74	78	79	80	81	81	82	82	82	82	83	83	83	83	83	83	82	82	82	81	80	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
24	0	75	78	79	80	81	81	82	82	82	82	82	82	83	82	82	82	82	81	81	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
21	0	75	78	79	80	81	81	82	82	82	82	82	82	82	82	82	81	81	80	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74
18	0	75	78	79	80	81	81	82	82	82	82	82	82	82	81	81	80	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74
15	0	75	78	80	80	81	81	81	82	82	82	81	81	81	80	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73
12	0	75	78	80	80	81	81	81	81	81	81	81	80	79	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72
9	0	74	78	79	80	80	81	81	81	80	80	79	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	71
6	0	0	77	79	79	80	80	80	79	78	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69
3	0	0	76	78	78	78	78	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-

n_c/O^+ n_c/N^+

Tab. 5b

50% N^+, 50% O^+, with squirrel cage

f($\times 10^2$)	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	n($\times 10^2$)
87	0	70	70	70	70	71	71	71	71	72	72	72	73	73	73	74	74	74	75	75	76	76	77	77	77	78	78	79	79	80	80	81	81	81	82	82	83	83	83	
84	0	70	70	70	71	71	71	71	72	72	72	73	73	73	74	74	74	75	75	76	76	77	77	77	78	78	79	79	80	80	81	81	82	82	82	83	83	83	84	
81	0	70	70	71	71	71	71	72	72	72	73	73	73	74	74	74	75	75	76	76	77	77	77	78	78	79	79	80	80	81	81	82	82	82	83	83	83	84	84	
78	0	70	70	71	71	71	72	72	72	73	73	73	74	74	74	75	75	76	76	77	77	77	78	78	79	79	80	80	81	81	82	82	82	83	83	84	84	84	84	
75	0	70	71	71	71	72	72	72	72	73	73	74	74	74	75	75	76	76	77	77	77	78	78	79	79	80	80	81	81	82	82	82	83	83	84	84	84	85	85	
72	0	71	71	71	71	72	72	72	73	73	74	74	74	75	75	76	76	77	77	77	78	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	
69	0	71	71	71	72	72	72	73	73	73	74	74	75	75	76	76	77	77	77	78	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	85	
66	0	71	71	72	72	72	73	73	73	74	74	75	75	76	76	76	77	77	78	79	79	80	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	
63	0	71	71	72	72	73	73	73	74	74	75	75	76	76	76	77	77	78	79	79	80	80	81	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	86	
60	0	71	72	72	72	73	73	74	74	75	75	75	76	76	77	77	78	79	79	80	80	81	81	82	82	82	83	83	84	84	84	84	85	85	85	86	86	86	86	
57	0	72	72	72	73	73	74	74	74	75	75	76	76	77	77	78	79	79	80	80	81	81	82	82	82	83	83	84	84	84	85	85	85	85	86	86	86	86	0	
54	0	72	72	73	73	73	74	74	75	75	76	76	77	77	78	79	79	80	80	81	81	82	82	82	83	83	84	84	84	85	85	85	85	86	86	86	86	0	0	
51	0	72	73	73	73	74	74	75	75	76	76	77	77	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	85	86	86	86	0	0	0	0	
48	0	72	73	73	74	74	75	75	76	76	77	77	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	86	86	0	0	0	0	0	
45	0	73	73	74	74	75	75	76	76	77	77	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	86	0	0	0	0	0	0	0	
42	0	73	73	74	75	75	76	76	77	77	78	79	79	80	80	81	81	82	82	83	83	83	84	84	84	85	85	85	86	86	86	0	0	0	0	0	0	0	0	
39	0	73	74	74	75	76	76	77	77	78	79	79	80	80	81	81	82	82	83	83	84	84	84	85	85	85	85	86	86	0	0	0	0	0	0	0	0	0	0	
36	0	74	74	75	75	76	77	77	78	79	79	80	80	81	81	82	82	83	83	84	84	84	85	85	85	85	86	86	0	0	0	0	0	0	0	0	0	0	0	
33	0	74	75	75	76	77	77	78	79	79	80	80	81	81	82	82	83	83	84	84	84	85	85	85	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	
30	0	75	75	76	76	77	78	78	79	80	80	81	81	82	82	83	83	84	84	84	85	85	85	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
27	0	75	76	76	77	78	78	79	80	80	81	81	82	82	83	83	84	84	84	85	85	85	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
24	0	75	76	77	78	78	79	80	80	81	82	82	83	83	83	84	84	84	85	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
21	0	76	77	78	78	79	80	80	81	82	82	83	83	83	84	84	85	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
18	0	77	77	78	79	80	80	81	82	82	83	83	83	84	84	85	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15	0	77	78	79	80	80	81	82	82	83	83	84	84	84	85	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	0	78	79	80	80	81	82	82	83	83	84	84	84	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	0	79	79	80	81	82	82	83	83	84	84	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	0	79	80	81	82	82	83	83	84	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	0	0	81	82	82	83	83	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
87	0	74	76	77	78	78	79	79	79	80	80	80	81	81	81	81	82	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	85	85	85	85	85	*
84	0	74	76	77	78	78	79	79	80	80	80	80	81	81	81	81	82	82	82	82	83	83	83	83	83	83	84	84	84	84	84	84	84	84	85	85	85	85	85	*
81	0	74	76	77	78	78	79	79	80	80	80	81	81	81	81	82	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	85	85	85	85	85	*
78	0	74	76	77	78	78	79	79	80	80	80	81	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	85	84	84	84	*
75	0	74	76	77	78	78	79	79	80	80	80	81	81	81	82	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	*
72	0	74	76	77	78	79	79	79	80	80	81	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	*
69	0	73	76	77	78	79	79	80	80	80	81	81	81	82	82	82	82	83	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	*
66	0	73	76	77	78	79	79	80	80	80	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	*
63	0	73	76	77	78	79	79	80	80	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	83	82	*
60	0	73	76	77	78	79	79	80	80	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	82	82	80	*
57	0	73	76	77	78	79	80	80	80	81	81	81	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	83	83	83	82	81	79	0	78
54	0	73	76	78	78	79	80	80	81	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	83	83	83	82	82	80	76	0	0	78
51	0	73	76	78	79	79	80	80	81	81	81	82	82	82	83	83	83	83	83	83	84	84	84	84	84	84	84	84	83	83	83	83	82	81	79	0	0	0	0	78
48	0	73	77	78	79	79	80	80	81	81	82	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	83	83	83	83	82	82	80	76	0	0	0	0	0	78
45	0	73	77	78	79	80	80	81	81	81	82	82	82	83	83	83	83	83	83	83	84	84	84	83	83	83	83	83	82	82	81	79	0	0	0	0	0	0	0	77
42	0	74	77	78	79	80	80	81	81	82	82	82	82	83	83	83	83	83	83	83	83	83	83	83	83	83	83	82	81	80	75	0	0	0	0	0	0	0	0	77
39	0	74	77	78	79	80	80	81	81	82	82	82	83	83	83	83	83	83	83	83	83	83	83	83	83	82	82	81	79	0	0	0	0	0	0	0	0	0	0	77
36	0	74	77	78	79	80	81	81	81	82	82	82	83	83	83	83	83	83	83	83	83	83	83	82	82	81	80	71	0	0	0	0	0	0	0	0	0	0	0	76
33	0	74	77	79	80	80	81	81	82	82	82	82	83	83	83	83	83	83	83	83	83	82	82	81	80	78	0	0	0	0	0	0	0	0	0	0	0	0	0	76
30	0	74	78	79	80	80	81	81	82	82	82	82	83	83	83	83	83	83	83	82	82	82	81	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76
27	0	75	78	79	80	81	81	81	82	82	82	82	83	83	83	83	83	82	82	82	81	80	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
24	0	75	78	79	80	81	81	82	82	82	82	82	82	82	82	82	82	82	81	80	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
21	0	75	78	79	80	81	81	82	82	82	82	82	82	82	82	82	81	81	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74
18	0	75	78	79	80	81	81	82	82	82	82	82	82	82	81	81	80	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73
15	0	75	78	80	80	81	81	81	81	82	81	81	81	81	80	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73
12	0	75	78	79	80	81	81	81	81	81	81	80	80	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72
9	0	74	78	79	80	80	80	81	80	80	79	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70
6	0	69	78	79	79	80	80	79	79	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69
3	0	0	76	78	78	78	78	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–

n_c

100 % O^+

Tab. 5c

f(x10^3)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	n(x10^2)
300	0	0	0	0	0	85	85	85	86	86	86	86	86	87	87	87	87	87	87	88	88	88	88	88	88	88	89	89	89	89	89	89	89	89	90	90	90	90	90	
200	0	0	0	0	0	0	86	86	86	86	87	87	87	87	87	87	88	88	88	88	88	88	89	89	89	89	89	89	89	89	90	90	90	90	90	90	90	90	0	
180	0	0	0	0	0	0	86	86	86	86	87	87	87	87	87	88	88	88	88	88	88	88	89	89	89	89	89	89	89	90	90	90	90	90	90	90	90	0	0	
160	0	0	0	0	0	0	0	86	86	87	87	87	87	87	88	88	88	88	88	88	88	89	89	89	89	89	89	89	89	90	90	90	90	90	90	0	0	0	0	
140	0	0	0	0	0	0	0	86	87	87	87	87	87	87	88	88	88	88	88	88	89	89	89	89	89	89	89	89	90	90	90	90	90	90	0	0	0	0	0	
120	0	0	0	0	0	0	0	86	87	87	87	87	87	88	88	88	88	88	88	88	89	89	89	89	89	89	89	90	90	90	90	90	0	0	0	0	0	0	0	
100	0	0	0	0	0	0	0	0	87	87	87	87	87	88	88	88	88	88	88	89	89	89	89	89	89	89	89	90	90	90	0	0	0	0	0	0	0	0	0	
80	0	0	0	0	0	0	0	0	87	87	87	87	88	88	88	88	88	88	89	89	89	89	89	89	89	89	90	90	0	0	0	0	0	0	0	0	0	0	0	
60	0	0	0	0	0	0	0	0	0	87	87	88	88	88	88	88	88	88	89	89	89	89	89	89	89	90	0	0	0	0	0	0	0	0	0	0	0	0	0	
40	0	0	0	0	0	0	0	0	0	0	87	88	88	88	88	88	88	89	89	89	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
20	0	0	0	0	0	0	0	0	0	0	0	0	88	88	88	88	89	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
18	0	0	0	0	0	0	0	0	0	0	0	0	88	88	88	88	89	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
17	0	0	0	0	0	0	0	0	0	0	0	0	88	88	88	88	89	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
16	0	0	0	0	0	0	0	0	0	0	0	0	88	88	88	88	89	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15	0	0	0	0	0	0	0	0	0	0	0	0	88	88	88	88	89	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
14	0	0	0	0	0	0	0	0	0	0	0	0	88	88	88	88	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
13	0	0	0	0	0	0	0	0	0	0	0	0	88	88	88	88	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	0	0	0	0	0	0	0	0	0	0	0	0	88	88	88	88	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	0	0	0	0	0	0	0	0	0	0	0	0	0	88	88	88	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	0	0	0	0	0	0	0	0	0	0	0	0	0	88	88	88	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	0	0	0	0	0	0	0	0	0	0	0	0	0	88	88	88	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	0	0	0	0	0	0	0	0	0	0	0	0	0	88	88	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	0	0	0	0	0	0	0	0	0	0	0	0	0	88	88	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	0	0	0	0	0	0	0	0	0	0	0	0	0	88	88	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	88	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	88	88	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	88	88	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	88	88	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	88	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
300	0	0	0	0	0	80	82	83	84	84	84	85	85	85	85	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	85	*
200	0	0	0	0	0	0	79	82	83	83	84	84	84	85	85	85	85	85	85	86	86	86	86	86	86	86	86	85	85	85	85	85	85	84	84	83	82	81	0	80
180	0	0	0	0	0	0	78	81	82	83	84	84	84	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	84	84	84	83	82	78	0	0	80
160	0	0	0	0	0	0	0	80	82	83	83	84	84	84	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	84	84	84	83	82	80	0	0	0	0	79
140	0	0	0	0	0	0	0	79	81	82	83	84	84	84	84	85	85	85	85	85	85	85	85	85	85	85	84	84	84	84	83	82	81	76	0	0	0	0	0	79
120	0	0	0	0	0	0	0	77	81	82	83	83	84	84	84	84	84	84	85	85	85	85	84	84	84	84	84	84	83	83	81	79	0	0	0	0	0	0	0	78
100	0	0	0	0	0	0	0	0	79	81	82	83	83	83	84	84	84	84	84	84	84	84	84	84	84	83	83	82	82	80	0	0	0	0	0	0	0	0	0	77
80	0	0	0	0	0	0	0	0	75	80	81	82	83	83	83	83	84	84	84	84	84	84	83	83	83	82	82	80	0	0	0	0	0	0	0	0	0	0	0	76
60	0	0	0	0	0	0	0	0	0	77	80	81	82	82	83	83	83	83	83	83	83	83	82	82	81	80	0	0	0	0	0	0	0	0	0	0	0	0	0	75
40	0	0	0	0	0	0	0	0	0	0	77	80	81	81	82	82	82	82	82	82	82	81	80	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73
20	0	0	0	0	0	0	0	0	0	0	0	0	78	80	80	81	81	81	80	80	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70
18	0	0	0	0	0	0	0	0	0	0	0	0	78	79	80	80	81	80	80	79	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70
17	0	0	0	0	0	0	0	0	0	0	0	0	77	79	80	80	80	80	80	79	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69
16	0	0	0	0	0	0	0	0	0	0	0	0	77	79	80	80	80	80	80	79	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69
15	0	0	0	0	0	0	0	0	0	0	0	0	76	79	80	80	80	80	80	79	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69
14	0	0	0	0	0	0	0	0	0	0	0	0	75	79	79	80	80	80	79	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69
13	0	0	0	0	0	0	0	0	0	0	0	0	74	78	79	80	80	80	79	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68
12	0	0	0	0	0	0	0	0	0	0	0	0	70	78	79	80	80	79	79	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68
11	0	0	0	0	0	0	0	0	0	0	0	0	0	78	79	79	79	79	78	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68
10	0	0	0	0	0	0	0	0	0	0	0	0	0	77	79	79	79	79	78	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67
9	0	0	0	0	0	0	0	0	0	0	0	0	0	77	78	79	79	79	78	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67
8	0	0	0	0	0	0	0	0	0	0	0	0	0	76	78	79	79	78	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66
7	0	0	0	0	0	0	0	0	0	0	0	0	0	75	78	78	78	78	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66
6	0	0	0	0	0	0	0	0	0	0	0	0	0	72	77	78	78	78	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	77	78	78	77	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76	77	77	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	76	77	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	76	76	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–

n_c

Tab. 6a

100 % H$^+$, without squirrel cage

Tab. 6b

50 % H^+, 50 % He^+, without squirrel cage

f(x10^3) \ n_c/He^+	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
300	0	0	81	82	82	83	83	83	84	84	85	85	85	86	86	86	86	87	87	87	87	87	88	88	88	88	88	88	89	89	89	89	89	89	89	89	90	90	90
200	0	0	0	82	83	83	84	84	85	85	85	86	86	86	87	87	87	87	88	88	88	88	88	88	89	89	89	89	89	89	89	89	90	90	90	0	0	0	0
180	0	0	0	83	83	83	84	84	85	85	85	86	86	86	87	87	87	87	88	88	88	88	88	89	89	89	89	89	89	89	89	90	90	0	0	0	0	0	0
160	0	0	0	83	83	84	84	84	85	85	85	86	86	87	87	87	87	88	88	88	88	88	88	89	89	89	89	89	89	89	90	90	0	0	0	0	0	0	0
140	0	0	0	83	83	84	84	85	85	85	86	86	86	87	87	87	88	88	88	88	88	88	89	89	89	89	89	89	89	90	90	0	0	0	0	0	0	0	0
120	0	0	0	0	83	84	84	85	85	85	86	86	86	87	87	88	88	88	88	88	88	89	89	89	89	89	89	89	90	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	84	84	84	85	85	85	86	86	87	87	87	88	88	88	88	88	89	89	89	89	89	89	89	90	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	84	84	85	85	85	86	86	86	87	87	88	88	88	88	88	89	89	89	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	84	85	85	85	86	86	86	0	88	88	88	88	88	89	89	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	84	85	85	85	86	86	86	0	88	88	88	88	89	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	85	85	85	86	86	0	0	88	88	88	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	85	85	85	86	86	0	0	88	88	88	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	85	85	85	86	86	0	0	88	88	88	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	85	85	85	86	86	0	0	88	88	88	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	85	85	85	86	86	0	0	0	88	88	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	85	85	85	86	0	0	0	0	88	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	85	85	86	86	0	0	0	0	88	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	85	85	86	86	0	0	0	0	88	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	85	86	86	0	0	0	0	88	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	85	86	86	0	0	0	0	88	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	85	86	86	0	0	0	0	88	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	85	86	86	0	0	0	0	88	88	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	85	86	86	0	0	0	0	88	88	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	85	86	86	0	0	0	0	88	88	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	85	86	86	0	0	0	0	88	88	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	85	86	0	0	0	0	0	0	88	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	85	86	0	0	0	0	0	0	88	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	85	86	0	0	0	0	0	0	88	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	86	0	0	0	0	0	0	88	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

f(x10^3) \ n_c/He^+	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	n(x10^2)
300	0	0	73	79	81	82	82	83	83	83	84	84	84	84	85	85	85	85	85	85	85	85	86	86	86	86	86	86	86	85	85	85	85	85	85	85	84	84	83	*
200	0	0	0	78	80	81	82	82	83	83	83	83	83	84	84	84	84	84	84	85	85	85	85	85	85	85	84	84	84	84	84	83	82	81	78	0	0	0	0	79
180	0	0	0	77	80	81	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	82	80	0	0	0	0	0	0	78
160	0	0	0	76	80	81	81	82	82	82	83	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	83	83	82	81	79	0	0	0	0	0	0	0	78
140	0	0	0	74	79	80	81	82	82	82	82	82	82	83	83	83	83	84	84	84	84	84	84	84	83	83	83	82	82	81	76	0	0	0	0	0	0	0	0	77
120	0	0	0	0	79	80	81	81	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	83	82	81	79	0	0	0	0	0	0	0	0	0	0	77
100	0	0	0	0	78	80	80	81	81	81	81	81	81	81	82	82	83	83	83	83	83	83	83	82	82	81	80	76	0	0	0	0	0	0	0	0	0	0	0	76
80	0	0	0	0	76	79	80	81	81	81	81	80	79	81	81	82	82	82	82	82	82	82	82	81	80	78	0	0	0	0	0	0	0	0	0	0	0	0	0	75
60	0	0	0	0	0	78	79	80	80	80	80	79	0	80	81	81	82	82	82	82	81	81	80	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74
40	0	0	0	0	0	75	78	79	79	79	79	76	0	78	80	81	81	81	81	80	80	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72
20	0	0	0	0	0	0	76	77	78	77	75	0	0	75	78	79	79	79	79	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69
18	0	0	0	0	0	0	75	77	77	77	74	0	0	74	78	79	79	79	78	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69
17	0	0	0	0	0	0	75	77	77	77	73	0	0	73	78	79	79	79	78	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68
16	0	0	0	0	0	0	74	77	77	77	72	0	0	70	78	79	79	79	78	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68
15	0	0	0	0	0	0	74	77	77	76	69	0	0	0	77	78	79	78	77	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68
14	0	0	0	0	0	0	73	76	77	76	0	0	0	0	77	78	79	78	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67
13	0	0	0	0	0	0	72	76	77	76	0	0	0	0	77	78	78	78	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67
12	0	0	0	0	0	0	70	76	77	76	0	0	0	0	77	78	78	78	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67
11	0	0	0	0	0	0	0	76	76	75	0	0	0	0	76	78	78	78	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66
10	0	0	0	0	0	0	0	76	76	75	0	0	0	0	76	78	78	77	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66
9	0	0	0	0	0	0	0	75	76	75	0	0	0	0	76	77	78	77	73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65
8	0	0	0	0	0	0	0	75	76	74	0	0	0	0	75	77	77	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65
7	0	0	0	0	0	0	0	75	75	73	0	0	0	0	74	77	77	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64
6	0	0	0	0	0	0	0	74	75	72	0	0	0	0	73	76	77	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64
5	0	0	0	0	0	0	0	73	75	70	0	0	0	0	72	76	76	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63
4	0	0	0	0	0	0	0	73	74	0	0	0	0	0	0	75	76	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62
3	0	0	0	0	0	0	0	71	73	0	0	0	0	0	0	75	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
2	0	0	0	0	0	0	0	63	73	0	0	0	0	0	0	74	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59
1	0	0	0	0	0	0	0	0	71	0	0	0	0	0	0	72	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–

f(x10³)

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
300	0	0	80	81	81	81	82	82	82	83	83	84	84	84	84	85	85	85	86	86	86	86	86	87	87	87	87	87	88	88	88	88	88	0	0	0	0	0	0
200	0	0	81	82	82	82	83	83	84	84	84	85	85	85	85	86	86	86	86	87	87	87	87	87	88	88	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	81	82	82	83	83	83	84	84	84	85	85	85	86	86	86	86	86	87	87	87	87	87	88	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	82	82	82	83	83	84	84	84	85	85	85	85	86	86	86	86	87	87	87	87	87	88	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	82	83	83	83	84	84	85	85	85	85	86	86	86	86	87	87	87	87	87	88	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	83	83	83	84	84	84	85	85	85	86	86	86	86	87	87	87	87	87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	83	83	84	84	84	85	85	85	85	86	86	86	86	87	87	87	87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	83	83	84	84	84	85	85	85	86	86	86	86	87	87	87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	84	84	84	85	85	85	86	86	86	86	87	87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	84	84	85	85	85	85	86	86	86	86	87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	84	85	85	85	86	86	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	84	85	85	85	86	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	84	85	85	85	86	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	85	85	85	86	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	85	85	85	86	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	85	85	85	86	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	85	85	85	86	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	85	85	85	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	85	85	85	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	85	85	85	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	85	85	85	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	85	85	85	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	85	85	85	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	85	85	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	85	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	85	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	85	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	85	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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300	0	0	78	80	81	82	83	83	83	84	84	84	84	84	84	85	85	85	85	85	85	85	85	85	84	84	84	84	83	83	82	81	75	0	0	0	0	0	0	79
200	0	0	77	80	81	82	82	83	83	83	84	84	84	84	84	84	84	84	84	84	83	83	83	82	82	80	0	0	0	0	0	0	0	0	0	0	0	0	0	77
180	0	0	76	80	81	82	82	83	83	83	83	84	84	84	84	84	84	84	83	83	83	83	82	81	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	77
160	0	0	74	79	81	82	82	83	83	83	83	83	83	84	84	83	83	83	83	83	82	82	81	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76
140	0	0	0	79	81	81	82	82	83	83	83	83	83	83	83	83	83	83	82	82	81	80	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76
120	0	0	0	78	80	81	82	82	82	83	83	83	83	83	83	83	82	82	82	81	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
100	0	0	0	77	80	81	81	82	82	82	83	83	83	82	82	82	82	81	80	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74
80	0	0	0	74	79	80	81	82	82	82	82	82	82	82	82	81	80	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73
60	0	0	0	0	78	80	81	81	81	81	81	81	81	81	80	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72
40	0	0	0	0	74	78	80	80	81	81	81	80	80	79	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70
20	0	0	0	0	0	74	78	79	79	79	79	78	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67
18	0	0	0	0	0	72	78	79	79	79	78	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67
17	0	0	0	0	0	68	77	78	79	79	78	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66
16	0	0	0	0	0	0	77	78	79	79	78	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66
15	0	0	0	0	0	0	77	78	79	78	78	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66
14	0	0	0	0	0	0	77	78	78	78	77	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66
13	0	0	0	0	0	0	76	78	78	78	77	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65
12	0	0	0	0	0	0	76	78	78	78	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65
11	0	0	0	0	0	0	76	77	78	78	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65
10	0	0	0	0	0	0	75	77	78	77	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64
9	0	0	0	0	0	0	75	77	77	77	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64
8	0	0	0	0	0	0	74	77	77	77	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63
7	0	0	0	0	0	0	72	76	77	76	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63
6	0	0	0	0	0	0	0	76	77	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61
5	0	0	0	0	0	0	0	75	76	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61
4	0	0	0	0	0	0	0	75	76	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
3	0	0	0	0	0	0	0	74	75	73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59
2	0	0	0	0	0	0	0	72	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57
1	0	0	0	0	0	0	0	0	73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–

$\uparrow$
n_c

n(x10²)

Tab. 6c

100 % He⁺, without squirrel cage

f(×10³)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	
300	0	0	85	85	85	86	86	86	86	86	87	87	87	87	87	87	88	88	88	88	88	88	88	89	89	89	89	89	89	89	89	90	90	90	90	90	90	90	90	
200	0	0	0	86	86	86	86	87	87	87	87	87	87	88	88	88	88	88	88	89	89	89	89	89	89	89	89	90	90	90	90	90	90	90	0	0	0	0	0	
180	0	0	0	86	86	86	87	87	87	87	87	87	88	88	88	88	88	88	89	89	89	89	89	89	89	89	90	90	90	90	90	90	90	0	0	0	0	0	0	
160	0	0	0	0	86	86	87	87	87	87	87	88	88	88	88	88	88	88	89	89	89	89	89	89	89	90	90	90	90	90	90	0	0	0	0	0	0	0	0	
140	0	0	0	0	86	87	87	87	87	87	87	88	88	88	88	88	88	89	89	89	89	89	89	89	89	90	90	90	90	90	0	0	0	0	0	0	0	0	0	
120	0	0	0	0	86	87	87	87	87	87	88	88	88	88	88	88	89	89	89	89	89	89	89	89	90	90	90	90	0	0	0	0	0	0	0	0	0	0	0	
100	0	0	0	0	0	87	87	87	87	88	88	88	88	88	88	88	89	89	89	89	89	89	89	90	90	90	0	0	0	0	0	0	0	0	0	0	0	0	0	
80	0	0	0	0	0	87	87	87	87	88	88	88	88	88	88	89	89	89	89	89	89	89	89	90	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
60	0	0	0	0	0	0	87	87	88	88	88	88	88	88	89	89	89	89	89	89	89	89	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
40	0	0	0	0	0	0	0	88	88	88	88	88	88	88	89	89	89	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
20	0	0	0	0	0	0	0	0	88	88	88	88	88	89	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
18	0	0	0	0	0	0	0	0	0	88	88	88	88	89	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
17	0	0	0	0	0	0	0	0	0	88	88	88	88	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
16	0	0	0	0	0	0	0	0	0	88	88	88	88	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15	0	0	0	0	0	0	0	0	0	88	88	88	88	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
14	0	0	0	0	0	0	0	0	0	88	88	88	88	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
13	0	0	0	0	0	0	0	0	0	88	88	88	88	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	0	0	0	0	0	0	0	0	0	88	88	88	88	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	0	0	0	0	0	0	0	0	0	88	88	88	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	0	0	0	0	0	0	0	0	0	88	88	88	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	0	0	0	0	0	0	0	0	0	0	88	88	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	0	0	0	0	0	0	0	0	0	0	88	88	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	0	0	0	0	0	0	0	0	0	0	88	88	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	0	0	0	0	0	0	0	0	0	0	88	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	0	0	0	0	0	0	0	0	0	0	88	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	0	0	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	0	0	0	0	0	0	38	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	0	0	88	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1	0	0	0	0	0	0	0	0	0	0	0	0	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
300	0	0	77	81	82	83	84	84	85	85	85	85	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	85	85	85	84	84	*
200	0	0	0	78	81	82	83	84	84	84	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	84	84	83	82	81	0	0	0	0	0	80
180	0	0	0	75	81	82	83	83	84	84	84	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	84	84	83	83	82	78	0	0	0	0	0	0	79
160	0	0	0	0	80	82	83	83	84	84	84	84	85	85	85	85	85	85	85	85	85	85	85	85	84	84	84	84	83	82	80	0	0	0	0	0	0	0	0	79
140	0	0	0	0	79	81	82	83	83	84	94	84	84	85	85	85	85	85	85	85	85	85	84	84	84	84	83	82	81	78	0	0	0	0	0	0	0	0	0	78
120	0	0	0	0	74	80	82	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	82	80	0	0	0	0	0	0	0	0	0	0	0	78
100	0	0	0	0	0	79	81	82	83	83	83	94	84	84	84	84	84	84	84	84	84	83	83	83	82	80	0	0	0	0	0	0	0	0	0	0	0	0	0	77
80	0	0	0	0	0	74	80	81	82	83	83	83	83	83	84	84	84	83	83	83	83	82	82	80	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76
60	0	0	0	0	0	0	77	80	81	82	82	83	83	83	83	83	83	83	82	82	81	80	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
40	0	0	0	0	0	0	0	78	80	81	81	82	82	82	82	82	82	81	81	79	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73
20	0	0	0	0	0	0	0	0	73	79	80	80	81	81	80	80	79	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70
18	0	0	0	0	0	0	0	0	0	78	79	80	80	80	80	80	79	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69
17	0	0	0	0	0	0	0	0	0	78	79	80	80	80	80	79	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69
16	0	0	0	0	0	0	0	0	0	77	79	80	80	80	80	79	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69
15	0	0	0	0	0	0	0	0	0	77	79	80	80	80	80	79	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69
14	0	0	0	0	0	0	0	0	0	77	79	79	80	80	79	79	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68
13	0	0	0	0	0	0	0	0	0	76	78	79	80	80	79	78	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68
12	0	0	0	0	0	0	0	0	0	75	78	79	79	79	79	78	73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68
11	0	0	0	0	0	0	0	0	0	74	78	79	79	79	79	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67
10	0	0	0	0	0	0	0	0	0	65	78	79	79	79	78	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67
9	0	0	0	0	0	0	0	0	0	0	77	78	79	79	78	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66
8	0	0	0	0	0	0	0	0	0	0	77	78	79	78	78	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66
7	0	0	0	0	0	0	0	0	0	0	76	78	78	78	77	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65
6	0	0	0	0	0	0	0	0	0	0	75	77	78	78	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65
5	0	0	0	0	0	0	0	0	0	0	73	77	78	77	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64
4	0	0	0	0	0	0	0	0	0	0	0	76	77	77	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63
3	0	0	0	0	0	0	0	0	0	0	0	75	76	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61
2	0	0	0	0	0	0	0	0	0	0	0	74	76	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
1	0	0	0	0	0	0	0	0	0	0	0	0	74	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–

↑ n_c

n(x10²)

Tab. 7a

100 % H^+, with squirrel cage

f(x10^3)	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
300	0	0	0	0	0	0	0	82	82	83	83	83	84	84	85	85	85	86	86	86	86	87	87	87	87	87	88	88	88	88	88	88	89	89	89	89	89	89	89
200	0	0	0	0	0	0	0	82	83	83	84	84	85	85	85	86	86	86	87	87	87	87	88	88	88	88	88	88	89	89	89	89	89	89	89	90	90	90	0
180	0	0	0	0	0	0	0	83	83	83	84	84	85	85	85	86	86	86	87	87	87	88	88	88	88	88	88	89	89	89	89	89	89	89	90	90	90	0	0
160	0	0	0	0	0	0	0	83	83	84	84	84	85	85	86	86	86	87	87	87	87	88	88	88	88	88	89	89	89	89	89	89	89	89	90	0	0	0	0
140	0	0	0	0	0	0	0	0	83	84	84	85	85	85	86	86	86	87	87	87	88	88	88	88	88	89	89	89	89	89	89	89	89	90	0	0	0	0	0
120	0	0	0	0	0	0	0	0	84	84	84	85	85	85	86	86	87	87	87	88	88	88	88	88	88	89	89	89	89	89	89	89	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	84	84	84	85	85	86	86	86	87	87	88	88	88	88	88	88	89	89	89	89	89	89	89	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	84	84	85	85	85	86	86	86	87	87	88	88	88	88	88	89	89	89	89	89	89	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	84	85	85	85	86	86	86	87	88	88	88	88	88	89	89	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	85	85	85	85	86	86	0	88	88	88	88	88	89	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	85	85	86	86	0	0	0	88	88	88	89	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	85	85	86	86	0	0	0	88	88	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	85	85	86	86	0	0	0	88	88	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	85	85	86	86	0	0	0	88	88	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	85	85	86	86	0	0	0	88	88	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	85	85	86	86	0	0	0	88	88	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	85	85	86	86	0	0	0	88	88	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	85	85	86	86	0	0	0	88	88	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	85	85	86	86	0	0	0	88	88	88	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	85	85	86	86	0	0	0	0	88	88	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	85	85	86	86	0	0	0	0	88	88	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	85	85	86	0	0	0	0	0	88	88	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	85	86	0	0	0	0	0	88	88	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	85	86	0	0	0	0	0	88	89	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	85	86	0	0	0	0	0	88	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	85	86	0	0	0	0	0	88	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	85	86	0	0	0	0	0	88	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	85	86	0	0	0	0	0	0	89	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	85	0	0	0	0	0	0	0	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

f(x10^3)	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	n(x10^2)
300	0	0	0	0	0	0	0	78	80	81	82	83	83	83	84	84	84	84	84	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	84	*
200	0	0	0	0	0	0	0	77	80	81	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	82	81	79	0	79
180	0	0	0	0	0	0	0	76	80	81	81	82	82	82	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	83	83	82	81	75	0	0	78
160	0	0	0	0	0	0	0	75	79	81	81	82	82	82	82	82	83	83	83	83	84	84	84	84	84	84	84	84	84	84	83	83	82	81	80	0	0	0	0	78
140	0	0	0	0	0	0	0	0	79	80	81	81	82	82	82	82	82	82	83	83	83	83	84	84	84	84	84	83	83	83	82	82	81	78	0	0	0	0	0	77
120	0	0	0	0	0	0	0	0	78	80	81	81	81	82	82	82	81	82	82	83	83	83	83	83	83	83	83	83	83	82	81	80	0	0	0	0	0	0	0	76
100	0	0	0	0	0	0	0	0	78	80	80	81	81	81	81	81	80	81	82	82	83	83	83	83	83	83	82	82	81	80	78	0	0	0	0	0	0	0	0	76
80	0	0	0	0	0	0	0	0	76	79	80	80	81	81	80	80	78	81	81	82	82	82	82	82	82	82	81	81	79	0	0	0	0	0	0	0	0	0	0	75
60	0	0	0	0	0	0	0	0	0	78	79	80	80	80	80	78	77	80	81	81	82	82	82	81	81	81	79	75	0	0	0	0	0	0	0	0	0	0	0	73
40	0	0	0	0	0	0	0	0	0	76	78	79	79	79	78	0	72	79	80	80	81	81	81	80	79	76	0	0	0	0	0	0	0	0	0	0	0	0	0	72
20	0	0	0	0	0	0	0	0	0	0	76	77	77	77	0	0	0	76	78	79	79	79	78	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69
18	0	0	0	0	0	0	0	0	0	0	76	77	77	76	0	0	0	76	78	79	79	79	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68
17	0	0	0	0	0	0	0	0	0	0	76	77	77	76	0	0	0	76	78	79	79	78	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68
16	0	0	0	0	0	0	0	0	0	0	75	77	77	76	0	0	0	75	78	79	79	78	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68
15	0	0	0	0	0	0	0	0	0	0	75	77	77	75	0	0	0	75	78	78	78	78	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67
14	0	0	0	0	0	0	0	0	0	0	75	77	77	75	0	0	0	74	77	78	78	78	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67
13	0	0	0	0	0	0	0	0	0	0	74	76	76	75	0	0	0	73	77	78	78	77	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67
12	0	0	0	0	0	0	0	0	0	0	74	76	76	74	0	0	0	72	77	78	78	77	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66
11	0	0	0	0	0	0	0	0	0	0	74	76	76	73	0	0	0	66	77	78	78	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66
10	0	0	0	0	0	0	0	0	0	0	73	76	76	73	0	0	0	0	77	78	77	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65
9	0	0	0	0	0	0	0	0	0	0	72	76	76	71	0	0	0	0	76	77	77	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65
8	0	0	0	0	0	0	0	0	0	0	70	75	75	0	0	0	0	0	76	77	77	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64
7	0	0	0	0	0	0	0	0	0	0	0	75	75	0	0	0	0	0	76	77	77	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64
6	0	0	0	0	0	0	0	0	0	0	0	75	74	0	0	0	0	0	75	76	76	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63
5	0	0	0	0	0	0	0	0	0	0	0	74	74	0	0	0	0	0	74	76	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62
4	0	0	0	0	0	0	0	0	0	0	0	74	73	0	0	0	0	0	73	76	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62
3	0	0	0	0	0	0	0	0	0	0	0	73	72	0	0	0	0	0	72	75	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61
2	0	0	0	0	0	0	0	0	0	0	0	72	70	0	0	0	0	0	0	74	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59
1	0	0	0	0	0	0	0	0	0	0	0	69	0	0	0	0	0	0	0	73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-

n_c/He^+ (at 4)

n_c/H^+ (at 12)

Tab. 7b

50 % H$^+$, 50 % He$^+$, with squirrel cage

$f (\times 10^3)$	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	80	81	81	82	82	82	83	83	84	84	84	84	85	85	85	86	86	85	86	86	87	87	87	87
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81	82	82	82	83	83	84	84	84	85	85	85	85	86	86	86	86	87	87	87	87	87	88	88	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81	82	82	83	83	83	84	84	84	85	85	85	86	86	86	86	87	87	87	87	87	88	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	83	83	83	84	84	84	85	85	85	86	86	86	86	86	87	87	87	87	87	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	83	83	84	84	84	85	85	85	85	86	86	86	86	87	87	87	87	87	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83	83	83	84	84	84	85	85	85	86	86	86	86	87	87	87	87	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83	83	84	84	84	85	85	85	86	86	86	86	87	87	87	87	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83	83	84	84	85	85	85	85	86	86	86	86	87	87	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	84	84	85	85	85	86	86	86	86	87	87	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	84	85	85	85	86	86	86	86	87	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	85	85	85	86	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	85	85	85	86	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	85	85	85	86	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	85	85	86	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	85	85	86	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	85	85	86	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	85	86	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	85	86	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	85	86	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	85	86	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	85	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	85	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	85	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	85	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	85	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	85	86	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

$f (\times 10^3)$	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	$n (\times 10^2)$
300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	77	80	81	82	82	83	83	83	84	84	84	84	84	84	85	85	85	85	85	85	84	84	84	84	84	*
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	80	81	82	82	83	83	83	83	84	84	84	84	84	84	84	84	83	83	83	82	82	81	77	0	77
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73	79	81	82	82	83	83	83	83	83	84	84	84	84	83	83	83	83	83	82	81	80	0	0	0	76
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	81	81	82	82	83	83	83	83	83	83	83	83	83	83	83	82	82	81	79	0	0	0	0	76
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	80	81	82	82	83	83	83	83	83	83	83	83	83	82	82	81	80	77	0	0	0	0	0	75
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	80	81	82	82	82	83	83	83	83	83	83	82	82	82	81	79	0	0	0	0	0	0	0	75
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	77	80	81	81	82	82	82	82	82	82	82	82	82	81	80	78	0	0	0	0	0	0	0	0	74
80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	79	80	81	81	82	82	82	82	82	82	81	80	79	0	0	0	0	0	0	0	0	0	0	73
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	80	81	81	81	81	81	81	81	80	79	77	0	0	0	0	0	0	0	0	0	0	0	72
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76	79	80	80	80	80	80	80	79	77	0	0	0	0	0	0	0	0	0	0	0	0	0	70
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76	78	79	79	79	78	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	78	79	79	79	78	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	78	78	79	78	77	73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	77	78	79	78	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73	77	78	78	78	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	71	77	78	78	78	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	77	78	78	78	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	77	78	78	77	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76	78	78	77	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76	77	77	77	73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76	77	77	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	77	77	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	77	77	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	76	76	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	76	76	73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68	75	75	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	–

n_c

Tab. 7c

100 % He^+, with squirrel cage

Tab.8: GROWTH OF INSTABILITY Comparison of selected data

sum of fractional loadings	100% 0%	50% 50%	0% 100%	N^+ N_2^+
1%	61	60	60	with SQC
2%	64	63	63	
1%	61	61	60	without
2%	65	64	63	

	100% 0%	50% 50%	0% 100%	N^+ O^+
3%	66	66	66	with SQC
15%	73	73	73	
45%	78	78	77	
3%	66	66	66	without
15%	73	73	73	
45%	78	78	78	

	100% 0%	50% 50%	0% 100%	H^+ He^+
1%	67	65	64	with SQC
2%	70	69	67	
4%	73	72	70	
10%	77	76	74	
20%	80	79	77	
1%	67	66	64	without
2%	70	69	67	
4%	73	72	70	
10%	77	76	74	
20%	80	79	77	