Supplementary Information for

Electronically nonadiabatic vibrational excitation of N_2 scattered from Pt(111)

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Table s1: Molecular constants for N_2 used to simulate the REMPI spectra.

Level	Constant	Value / cm^{-1}	Reference
	$\nu_{a''(0)}$	98840.60189(15)	a
	B_0''	1.9895776(10)	a,b
	D_0''	$5.74137(100) \times 10^{-6}$	a,b
$v = 0$	H_0''	$4.843(1.000) \times 10^{-12}$	ab
	B_0'	1.9137062(15)	a
	D_0'	$6.0000(25) \times 10^{-6}$	a
	$\nu_{a''(0)}$	98655.3(2)	c
$v = 1$	B_1''	1.9717(6)	c
	B_1'	1.882(1)	c

a) E. J. Salumbides, A. Kharmov and W. Ubachs *J. Phys. Chem. A* **2009**, 113, 2383, b) T. Trickl, D. Proch and K. Kompa *J. Mol. Specrosc*. **1995**, 171, 374 c) T. F. Hanisco and A. C. Kummel *J. Phys. Chem*. **1991**, 95, 8565

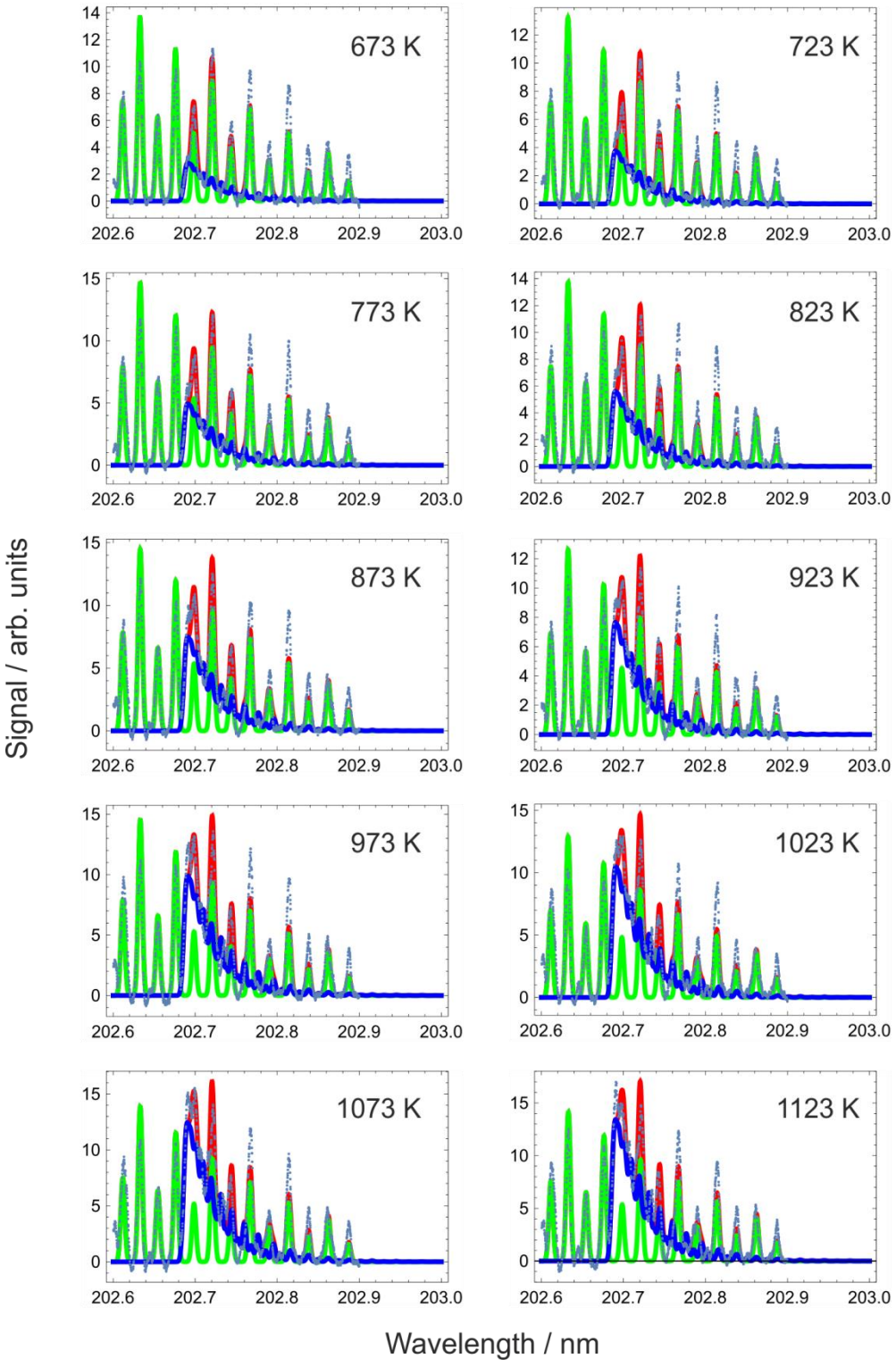

Figure s1: Examples of fits to of the N_2 REMPI simulation to the experimental data for different T_s. The $v = 0$ O branch is shown in green, the $v = 1$ Q branch in blue and the total in red. The experimental data is shown by the points.