

Exploring the incorporation of nitrogen in titanium and its influence on the electrochemical corrosion resistance in acidic media

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Table 1: Summary of associated BE and chemical state for Ti 2p, O 1s and N 1s XP spectra.

Orbital	TiO _x /Ti ⁴⁺	TiO _{x-2} N _x	TiN _x /Ti ³⁺	O ₂ /H ₂ O	NO _x
Ti 2p	459.2 eV	457.2 eV	454.9 eV		
O 1s	530.6 eV	531.4 eV		532.5 eV	533.3 eV
N 1s		396.5 eV	397.0 eV		400.5 eV

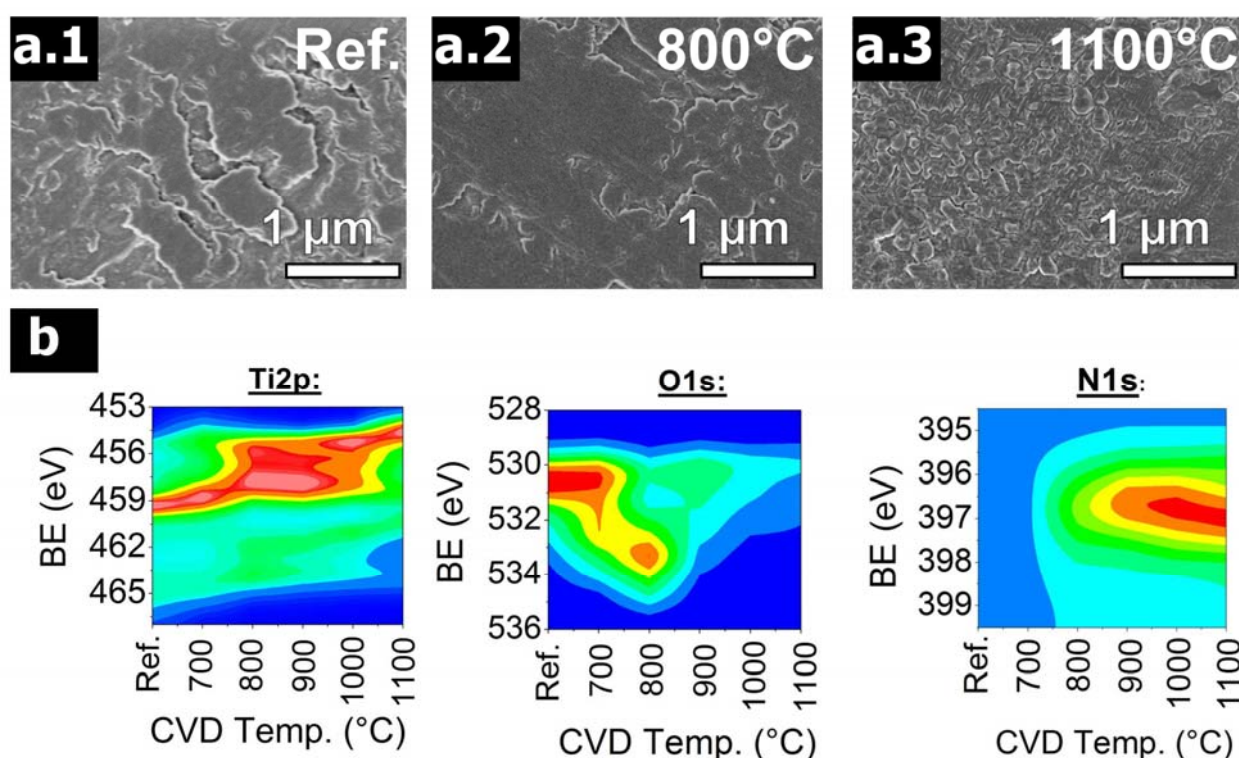


Figure 1: a) SEM pictures of the CVD of TiN_x process fabricated at different temperature. b) Ti 2p, O 1s and N 1s XP spectra vs. temperature.

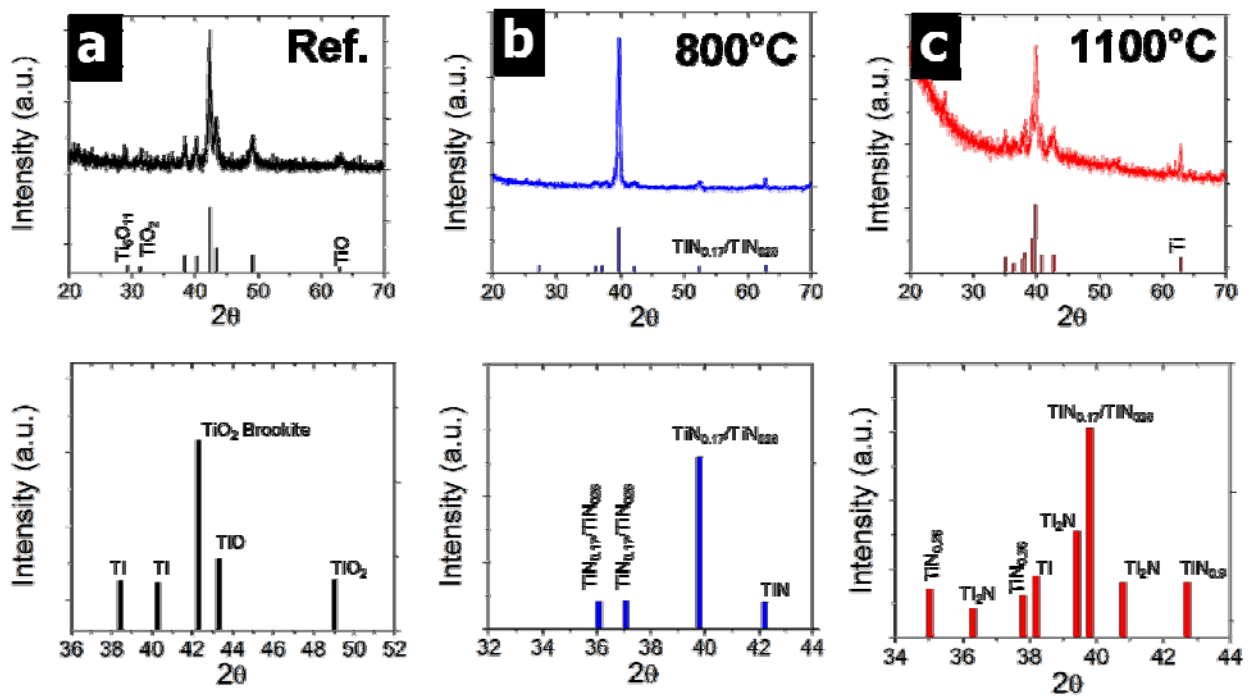


Figure 2: XRD spectra (top) and species inset (bottom) of a) pristine Ti samples b) nitrified from NH_3 at 800°C and c) at 1100°C .

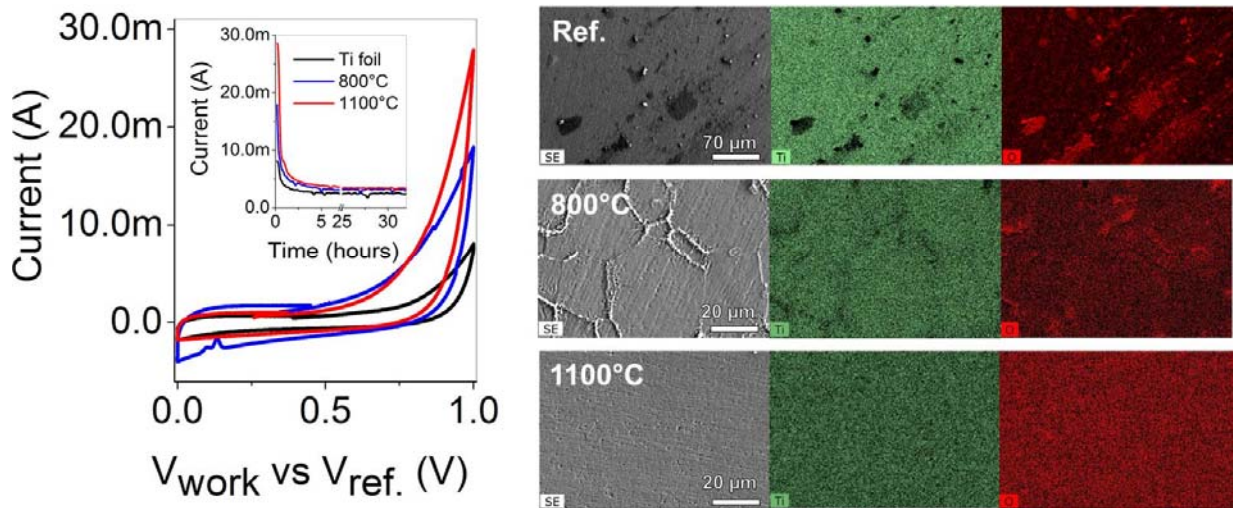


Figure 3: CA measurements in 1 M of HClO_4 during ~ 32 hours and the effect in the film shows by SEM/EDX after the electrochemical stress test.

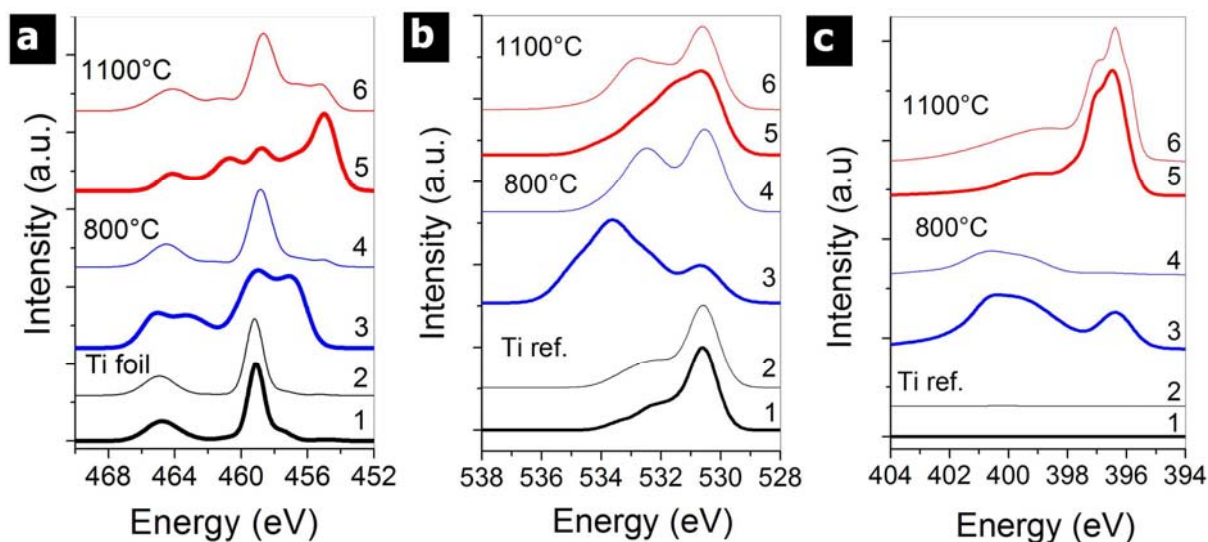


Figure 4: XPS measurements before and after electrochemical stress test: a) Ti 2p, b) O 1s and c) N 1s.

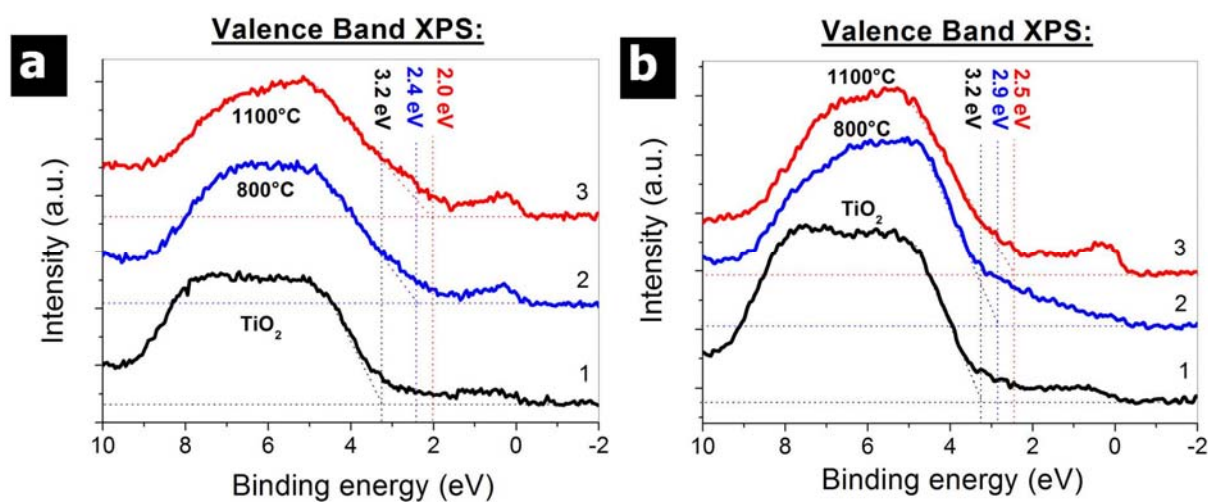


Figure 5: a) Valence band spectra before the electrochemical stress test. b) Valence band spectra after the electrochemical stress test.

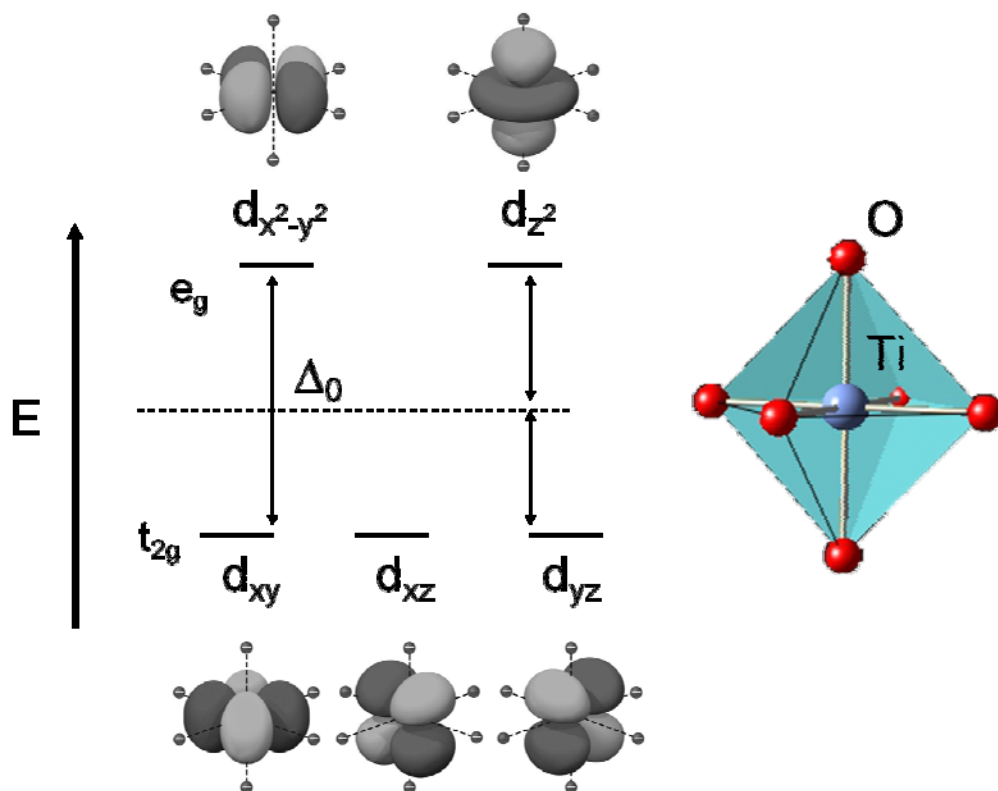


Figure 6: Schematic of the d-orbitals splitting in energy t_{2g} and e_g .

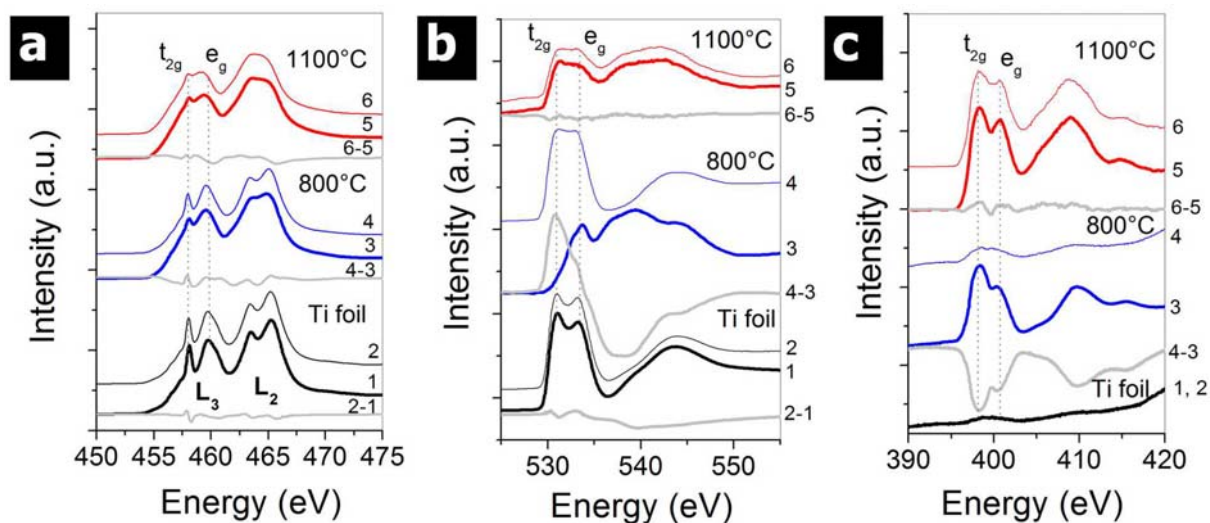


Figure 7: NEXAFS measurements before and after electrochemical stress test: a) Ti L-edge, b) O and c) N K-edges.