TiO$_2$ Films on Si(111) by Dilute Aqueous Chemical Bath Deposition

J.F. ANDERSON, University of Louisiana at Monroe, ERINE MORALES, Tulane University, AARON HAMILTON, University of Louisiana at Monroe, UR-RIKE DIEBOLD, Tulane University — Dilute Aqueous Chemical Bath Deposition (CBD) from highly acidic (pH < 1) TiCl$_3$ HCl solutions at room temperature and slightly higher (23°C – 40°C) produced thin titanium dioxide films on clean Si(111). We report initial results of X-ray Photoelectron Spectroscopy (XPS), Scanning Electron Microscopy (SEM), and X-ray Diffraction (XRD). The films thicknesses varied from 300 nm to ~1 µm. It was found that the films required annealing to ensure adherence to the Si(111) substrate. XRD showed that the rutile structure was present in the TiO$_2$.