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Chemical Deposition and Photoactivity of Anatase and Rutile TiO₂ Films on Si(111). JOHN F. ANDERSON, University of Louisiana at Monroe, ERIE MORALES, ULRIKIE DIEBOLD, Tulane University — Dilute Aqueous Chemical Bath Deposition (CBD) from highly acidic (pH < 1) TiCl₃ 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) measurements. The films thicknesses varied from 300 nm to ~ 1μm. It was found that the films required annealing to ensure adherence to the Si(111) substrate. XRD showed that the anatase and rutile structures were present in the TiO₂ as a function of post-deposition annealing temperature. Additionally, photo decomposition results of methyl orange and methyl blue on TiO₂/Si(111) system under UV light is observed and reported.

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