



SUBSTANTIAL LIFETIME ENHANCEMENT OF SI-BASED PHOTOANODES ENABLED BY AMORPHOUS TiO₂ COATING WITH IMPROVED STOICHIOMETRY

[View U.S. Patent Application Publication No. US-2025-0019839 in PDF format.](#)

WARF: P230258US02

Inventors: Xudong Wang, Yutao Dong, Dane Morgan, Jun Meng, Jinwoo Hwang, Mehrdad Abbasi Gharacheh

The Invention

UW-Madison researchers have developed a post-ALD in-situ water treatment procedure that removes residual Cl ligands from amorphous TiO₂ films and thereby extends the photoelectrochemical cell's protection lifetime. This method partially removed the Cl residues and improved the film stoichiometry without introducing any additional crystallization. The processed amorphous TiO₂ film showed drastically improved chemical stability, and substantially elongated the lifetime of Si photoanodes to ~600 hours in an alkaline electrolyte.

Additional Information

For More Information About the Inventors

- [Xudong Wang](#)
- [Dane Morgan](#)

Tech Fields

- [Clean Technology : Solar, wind & water technologies](#)
- [Materials & Chemicals : Catalysts](#)

For current licensing status, please contact Michael Carey at mccarey@warf.org or 608-960-9867