**Sintering Temperature effect on CuO/SrTiO3 Composites**

**in Photoelectrochemical Water Splitting**

**Surbhi Choudhary\***

*Department of Chemistry, DPG Degree College, Gurugram-122001 (India)*

Email: [drsurbhichoudhary@gmail.com](mailto:drsurbhichoudhary@gmail.com)

As observed earlier by various researchers, composites of two semiconductors of varying bandgap possessing different energy levels for their corresponding conduction and valence band was promising towards achieving significant photoelectrochemical activity. The small band gap semiconductor is primarily responsible for visible light absorption and sensitizing the large band gap semiconductor through electron and/or hole injection. The energy layers in the composites semiconductors can cover visible spectrum thereby offering synergistic effect.

Present study shows the effect of various sintering temperatures on various thicknesses of CuO in CuO (1.7eV)/SrTiO3 (3.2 eV)composites with respect to PEC water splitting. Prepared thin films were characterized for: (a) crystalline phase by XRD analysis, (b) band gap energy by spectrometric measurement and (c) surface morphology by AFM and SEM analysis. Subsequently, CuO/SrTiO3 composite was used in a PEC cell as working electrode having platinum and saturated calomel as counter and reference electrode respectively and 150 W Xenon lamp (Bentham) as light source for illumination. Maximum PEC response was observed for CuO/SrTiO3 composites sintered at 500˚C *i.e.* 1.13 mA/cm2 at -0.9 V/SCE under visible light illumination. The result reveals combinatorial approach of a low bandgap material (CuO) and a wide bandgap material (SrTiO3) with an optimum thickness (690 nm) and sintered at optimal temperature (500˚C) significantly enhances photoelectrochemical response in the visible region.

*Keywords:* *Photoelectrochemical cell, Composites,* SrTiO3, CuO*, Water splitting*

**Thrust Area** – Material Sciences, Hydrogen generation via Photoelectrochemical

Water Splitting

**Category** - Research