

## ABSTRACT

Methyl orange, a synthetic dye containing azo groups, is difficult to biodegrade and is environmentally carcinogenic. This study developed a CuO-ZnO/ITO photocatalyst electrode to degrade methyl orange through the photoelectrocatalysis process. ZnO/ITO and CuO-ZnO/ITO electrodes were synthesized using the chemical bath deposition method with variation of Cu concentration (2% and 5%). Characterization was done using XRD, SEM-EDX, and UV-DRS. XRD results showed that CuO doping on ZnO did not change the hexagonal wurtzite structure of ZnO. SEM characterization shows CuO-ZnO/ITO has a nanorods-shaped morphology and the presence of CuO is confirmed in EDX analysis. UV-DRS analysis showed a decrease in the band gap value of ZnO/ITO, 2% CuO-ZnO/ITO, and 5% CuO-ZnO/ITO with values of 3.18 eV, 3.06 eV, and 3.01 eV, respectively. The photoelectrocatalysis process under UV light for 90 minutes showed an increase in methyl orange degradation efficiency, reaching 77.02% (ZnO/ITO), 90.63% (2% CuO-ZnO/ITO), and 97.54% (5% CuO-ZnO/ITO).

**Keywords:** Thin film, CuO-ZnO, Chemical bath deposition, Methyl orange