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Langmuir–Hinshelwood (L– H) adsorption isotherm and photo degradation of copper surfactants derived from long chain saturated fatty acid catalyzed by zinc oxide

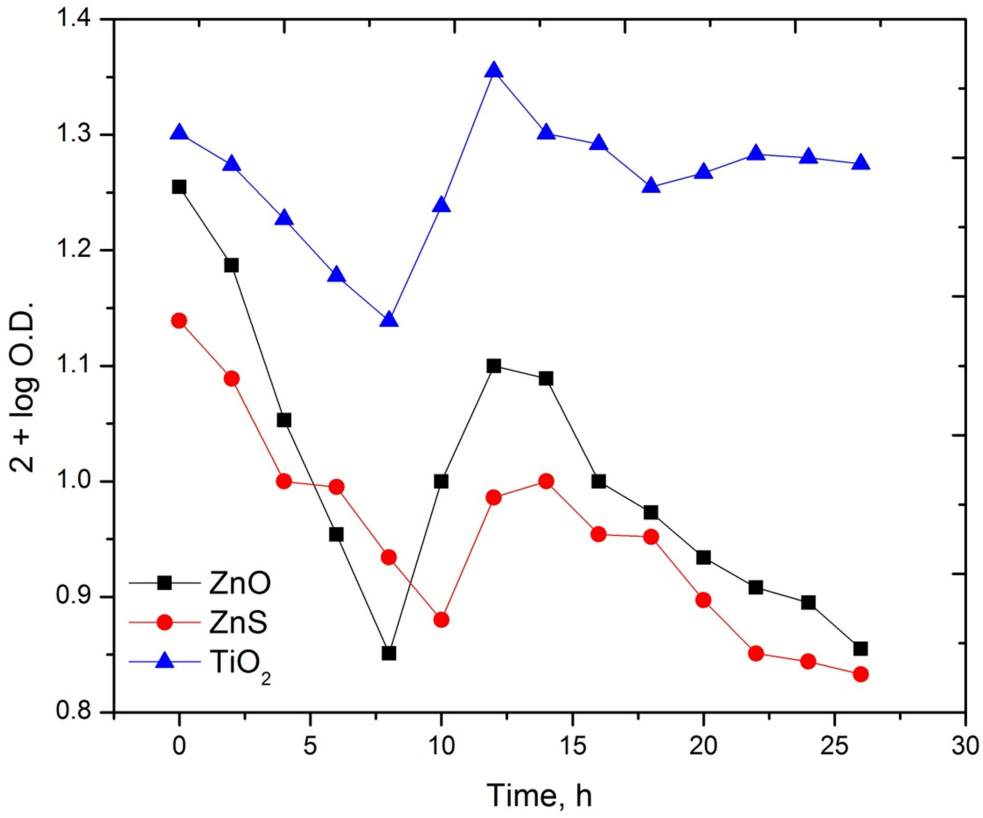

Photo catalysis process is a relatively novel subject with tremendous potential in the near future because of its environmental applications. Large molecules such as copper stearate soap (CS) and copper palmitate (CP) cannot be metabolized rapidly by microorganisms naturally. Photo catalytic degradation has been considered to be an efficient and rapid process for the degradation of copper soaps derived from long chain saturated fatty acid. The zinc oxide as semiconductor

can be effectively used as a catalyst for the photochemical degradation of surfactants causing environment pollution. The progress of the reaction has been monitored spectrophotometrically by measuring the absorbance of the reaction mixture at definite time intervals. Different parameters such as the concentration of soap, dose of semiconductor, light intensity, effect of solvent polarity were varied to achieve the optimum rate of photo degradation.The observations revealed that CS and CP soaps were degraded successfully by using ZnO under UV. The disappearance of copper surfactants follows a pseudo-first-order kinetics according to the Langmuir–Hinshelwood (L–H) model.A tentative mechanism has been proposed for the photo degradation of copper surfactants.

Key words*:*Zinc oxide;Photo catalytic degradation; Semiconductor; Copper surfactants.