Adsorption and Kinetics Properties of TiO₂ photoelectrode using Natural Paprika Oleoresin (*Capsicum annuum L.*) Dye for Dye-Sensitized Solar Cells

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The adsorption characteristics of paprika oleoresin (*Capsicum annuum L.*) on TiO₂ thin film for a dye-sensitized solar cell (DSSC) were investigated in terms of temperature. The maximum adsorption amount of paprika oleoresin on TiO₂ thin film was approximately 142 mg/g. The adsorption heterogeneity for the adsorption system of paprika oleoresin on TiO₂ thin film increased with increasing temperature. Kinetic studies showed that the adsorption of paprika oleoresin on TiO₂ thin film followed pseudo-first-order model. The energy conversion efficiency of the TiO₂ electrode with successive adsorptions of paprika oleoresin natural dye was about 0.14%.

Keywords: Adsorption, Dye, Heterogeneity, Kinetics, paprika oleoresin

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