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Anatase/Rutile composite thin films prepared via dip coating technique and their hydrophilicity, stability and photocatalytic activity

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In this work, Titanium dioxide (TiO2) mix phase powders with specific mixing ratio were prepared by sono-chemical process in combination with calcination at different temperature in range of 400oC to 1000oC. The as-prepared powders were dispersed with tetraethyl orthosilicate (TEOS) as supported matrix of TiO2 for homogeneous colloid and used as starting precursor for thin film coating. The designated thin films were deposited onto glass substrates by dip coating process. X-ray diffraction technique was employed to evaluate TiO2 phase ratio meanwhile the film morphologies and hydrophilicity were investigated using scanning electron microscope and water contact angle, respectively. UV-Vis spectrophotometer was used to analyse the optical properties of the film. Photocatalytic activity of the prepared film was performed by mean of the decolorization of Rhodamine B dye solution under solar irradiation. The photocatalytic performance of assigned films were investigated and correlated mechanisms responsible for the activity are discussed.

Primary author: IBRAHIM, AMMAR

Co-author: MEKPRASART, Wanichaya (King Mongkut's Institute of Technology Ladkrabang)

Presenter: IBRAHIM, AMMAR

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