

Thesis Title Synthesis and Characterization of Titanium Dioxide Nanoparticles by Sol-gel and Reflux Methods for Dye-sensitized Solar Cell

Author Mr. Thirawit Phonkhokkong

Degree Master of Science (Applied Physics)

Advisory Committee Assistant Professor Dr. Wonchai Promnopas Advisor
Professor Emeritus Dr. Somchai Thongtem Co-advisor

Abstract

In this research, titanium dioxide (TiO₂) nanopowders were synthesized by sol-gel and refluxing methods, and compared with commercial titanium dioxide (P25). The as-synthesized TiO₂ samples were characterized by X-ray diffraction, Raman spectroscopy, scanning and transmission electron microscopy, energy dispersive X-ray (EDX) spectroscopy, selected area electron diffraction (SAED), and UV-vis and photoluminescence (PL) spectroscopy. The as-synthesized samples were used to fabricate dye sensitized solar cell and found that TiO₂ synthesized by sol-gel method by immersion duration 1 h has the highest efficiency for $V_{oc} = 0.497$ V, $J_{sc} = 10.156$ mA/cm² and FF = 0.381.

Copyright © by Chiang Mai University
All rights reserved