
Effect of Calcination Temperatures on the Photocatalytic Activities of Commercial Titania Nanoparticles under Solar Simulator Irradiation

Wai Ruu Siah¹, Hendrik O. Lintang¹, Mustaffa Shamsuddin², Leny Yuliaty^{1*}

¹ *Centre for Sustainable Nanomaterials, Ibnu Sina Institute for Scientific and Industrial Research, Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Johor, Malaysia.*

² *Department of Chemistry, Faculty of Science, Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Johor, Malaysia.*

***Corresponding author: leny@ibnusina.utm.my**

ABSTRACT

In this study, the effect of calcination temperatures on the photocatalytic activity of commercial TiO₂ photocatalysts (Evonik P25, Evonik P90, Hombikat UV100, Hombikat N100) was evaluated for degradation and removal of 2,4-dichlorophenoxyacetic acid (2,4-D) herbicide under solar simulator irradiation. The calcined samples were prepared by heating commercial TiO₂ photocatalysts at 573 or 773 K for 4 hours. It was confirmed that before calcination treatment, the P25 TiO₂ showed similar activity to the P90 TiO₂, which activity was higher than those of Hombikat UV100 and N100 TiO₂. The activity of P25 and P90 was reduced when the photocatalysts were calcined at 573 K and 773 K. On the other hand, the Hombikat catalysts showed an improved activity with the increase of calcination temperatures.

| Commercial TiO₂ nanoparticles | Calcination temperature | 2,4-Dichlorophenoxyacetic acid | Solar simulator |
