Chalermpan Ngamsopasiriskun 2010: Preparation of TiO_2 Supported Activated Carbon for Treatment of Phenol and Acid Orange 7. Master of Science (Chemistry), Major Field: Chemistry, Department of Chemistry. Thesis Advisor: Associate Professor Apisit Songsasen, Ph.D. 150 pages.

TiO_2/AC was prepared via the sol-gel method, which studied in term of titania precursors. From the characterization results, it was found that TiO_2/AC using titanium(IV) isopropoxide calcined at 400ºC provided the most appropriate properties for performing as the photocatalyst. TGA, Raman and XRD results indicated that this TiO_2/AC catalyst had high crystallinity. SEM and TEM results demonstrated that its surface morphology was particle of AC covered throughout by TiO_2. Moreover, with increasing calcination temperature, its amorphous-to-anatase phase transformation was retarded by the presence of AC. Adsorption of phenol by TiO_2/AC was fitted with the Langmuir isotherm that indicated the monolayer adsorption system, and showed highest thermodynamic stability. All of these properties enhanced the removal efficiency of TiO_2/AC under UV light.

Regarding the photocatalytic activity, TiO_2/AC using titanium(IV) isopropoxide calcined at 400ºC succeeded in degradating phenol and acid orange 7 with the highest efficiency. However, its photocatalytic activity drastically decreased when it was calcined at higher temperature due to the AC was oxidized totally. Besides, the recycling efficiency of catalyst decreased when it was repeatedly used in photocatalytic runs due to the deactivation of catalyst surface.

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