

Preparation of titania hollow spheres by using spray pyrolysis and their application to the photocatalyst

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Hollow titania particles have extensive applications in the fields of optics and electronics due to the large refractive index contrast between the core and shell materials. Moreover, hollow titania particle is in a highlight as a photocatalyst because maximized surface area is expected to improve the photocatalytic property. Conventional liquid-phase processes to fabricate hollow titania have drawbacks in that complex multiple-step processes produce large amount of pollutants and aggregation among the hollow particles during heat-treatment is not possible to control. Spray pyrolysis can simplify required steps to produce hollow titania thus effectively reduce the amount of pollutants. Furthermore, spray pyrolysis can reduce aggregation of particles because produced particle sizes are within the confines of droplet sizes. To evaluate the photoactivity of produced titania hollow particles, initial decomposition rates of Methylene Blue made by Degussa P-25 and hollow titania particles were compared.