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Adsorption and Photocatalytic Characteristics of Activated Carbon Made from TiO₂-coated Woody Waste

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Abstract: Composite powder materials consisting of activated carbon and TiO₂ were prepared through the carbonization of woody waste powders coated with TiO₂ gel by using the sol-gel method. The effect of the conditions for preparing TiO₂ sols and the carbonization process on the properties of the resulting composites was examined. It was found that the addition of diethanolamine (DEA) to the TiO₂ sol was effective for achieving a smooth coating on woody waste-derived activated carbon. The composites obtained by heat-treating the wood powders coated with DEA and polyethylene glycol (PEG)-added TiO₂ gel with at 530°C and 700°C exhibited both the adsorption and the photocatalytic decomposition of methylene blue in water.

Keywords: TiO₂, activated carbon, adsorption, photocatalytic ability, sol-gel method

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