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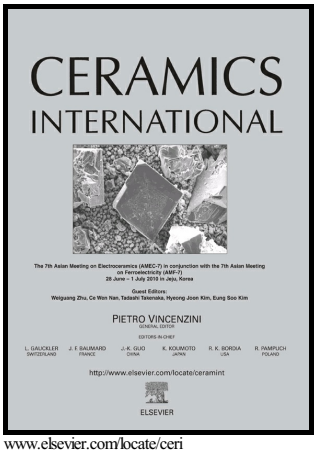

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A novel synthesis method of hierarchical mesoporous MgO nanoflakes employing carbon nanoparticles as the hard templates for photocatalytic degradation

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Abstract:

We describe a novel synthesis method for the preparation of bimodal mesoporous MgO nanoflakes and their application in photocatalytic activity for the degradation of methylene blue dye under UV light irradiation. For this purpose, $Mg(OH)_2$/carbon nanocomposite was obtained through the precipitation of magnesium hydroxide in the presence of carbon nanoparticles. X-ray diffraction pattern (XRD), scanning electron microscopy (SEM), and transition electron microscopy (TEM) micrographs have shown that this strategy could be successfully used to prepare bimodal mesoporous MgO nanoflakes with two different pore size distributions centered at 3 and 25 nm and a high specific surface area of 216.9 m^2/g. Furthermore, the product was used as an adsorbent to remove methylene blue dye from aqueous media. The results confirmed that the photocatalytic activity of the synthesized mesoporous MgO was significantly improved due to the presence of such different pore sizes and high specific surface area resulting in higher adsorption, storage, and degradation of dye molecules.

Keywords: Synthesis, Magnesium oxide, Nanoflakes, Mesoporous, Photocatalyst ,Organic dyes

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