

## Comparison of the photocatalytic activities of sol-gel and flame spray pyrolysis derived MgO nanoparticles

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### Abstract

In this study, nanoscale MgO powders were synthesized by means of sol-gel and flame spray pyrolysis techniques. Regarding phase structures, particle size, specific surface area, and morphologies were determined using X-ray diffractometer (XRD), particle size analyzer, Brunauer-Emmett-Teller (BET) specific surface area measurement device, and scanning electron microscope, respectively. In order to determine photocatalytic activity of the powders aqueous methylene blue (MB) solutions were employed. The degradation rates of MB solutions were recorded using UV-Vis spectrophotometer. It was found that both sol-gel and flame spray synthesized MgO nanoparticles exhibited appreciable photocatalytic activity for the degradation of methylene blue dye under UV light irradiation with small differences. Moreover, the effect of particle size and surface area on the photocatalytic properties were investigated in details.

**Keywords:** Magnesium oxide; Flame spray pyrolysis; Sol-gel process; Photocatalysis; Methylene blue