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**CuO/WO₃ and Pt/WO₃ nanocatalysts for efficient pollutant degradation using visible light irradiation**Hendri Widiyandari^a, Agus Purwanto^b, Ratna Balgis^c, Takashi Ogi^c,  , Kikuo Okuyama^c^a Department of Physics, Faculty of Mathematic and Natural Science, Diponegoro University, Jl. Prof. H. Soedarto SH, Semarang, Central Java, 50275, Indonesia^b Department of Chemical Engineering, Faculty of Engineering, Sebelas Maret University, Jl. Ir. Sutami 36 A, Surakarta, Central Java, 57126, Indonesia^c Department of Chemical Engineering, Graduate School of Engineering, Hiroshima University, 1-4-1 Kagamiyama, Higashi Hiroshima 739-8527, Japan<http://dx.doi.org/10.1016/j.cej.2011.10.095>, How to Cite or Link Using DOI[Permissions & Reprints](#)[View full text](#)[Purchase \\$31.50](#)Rent the full-text
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Abstract

CuO/WO₃ and Pt/WO₃ nanocatalysts with a nanorod morphology were used for photodegradation of organic compounds using visible light irradiation. Both nanocatalysts were prepared using flame assisted spray pyrolysis method (FASP). The prepared nanocatalysts were mechanically stable during the agitation treatment for the photodegradation test due to good interconnection between WO₃ and co-catalysts. The enhancement of photocatalytic activity was observed after the addition of CuO and Pt as co-catalysts. The addition of CuO would change the morphology of WO₃ from nanorods to cubic. The optimal concentration of the CuO addition was 0.33 wt.%. A low Pt concentration (0.12 wt.%) was required for optimal photocatalytic activity of the Pt/WO₃ nanocomposite. The addition of Pt affected neither the morphology nor the crystallite structure of WO₃.

Highlights

- ▶ We synthesized Pt/WO₃ and CuO/WO₃ nanocatalysts using flame assisted spray pyrolysis.
- ▶ Photocatalytic activities were enhanced by addition of CuO and Pt as co-catalysts.
- ▶ The prepared nanocatalysts were mechanically stable for the Photodegradation.
- ▶ The optimal concentration of the Pt addition was 0.12 wt.% for photocatalytic activity.
- ▶ The addition of CuO changes the morphology of WO₃ from nanorod to cubic shape.