

Synthesis of Cu-doped MOF-235 for the degradation of methylene blue under visible light irradiation

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Cu-doped MOF-235 particles with various Cu concentrations were successfully prepared using the solvothermal method and investigated for the degradation of methylene blue (MB) under visible light irradiation. X-ray diffraction (XRD), field emission scanning electron microscopy (FE-SEM), and X-ray photoelectron spectroscopy (XPS) were used for the characterizations. The surface area of the Cu-doped MOF-235 was smaller than that of pure MOF-235 due to pore blockage by the deposited Cu metal. Moreover, the coexistence of Cu^+ and Cu^{2+} species in Cu-doped MOF-235 was revealed by XPS analysis. The photocatalytic performances of MOF-235 doped with various Cu concentrations were evaluated by the photocatalytic degradation of methylene blue (MB) in aqueous solution under visible light irradiation. The results indicated that Cu-doped MOF-235 outperformed pure MOF-235 and commercial TiO_2 . After 8h of photocatalytic degradation of MB, 40% of the Cu-doped MOF-235 sample exhibited the highest degradation efficiency of 90%, while pure MOF-235 and commercial TiO_2 showed the degradation efficiencies of 10% and 5%, respectively.