

Pengaruh Doping Fe Terhadap Karakteristik dan Aktivitas Fotokatalitik Bi₂O₃ untuk Degradasi Amoxicillin

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Abstrak

Telah dilakukan penelitian tentang material Bismut Oksida doping Besi (Bi₂O₃/Fe) menggunakan metode presipitasi berbantuan radiasi gelombang mikro. Tujuan dari penelitian ini yaitu menganalisis pengaruh penambahan Fe terhadap karakteristik Bi₂O₃ dan menganalisis kemampuannya dalam degradasi *Amoxicillin*. Penambahan Fe dilakukan dengan berbagai konsentrasi yaitu 0%, 1%, 3%, 5%, 7%, dan 9%. Hasil sintesis dikarakterisasi menggunakan *X-Ray Diffraction* (XRD) untuk menentukan struktur dan ukuran kristal. Kemudian dikarakterisasi menggunakan *Scanning Electron Microscopy-Energi Dispersive X* (SEM-EDX) untuk mengetahui morfologi, ukuran partikel, dan unsur-unsur kimia yang terkandung didalam material. Selain itu, dilakukan pengukuran energi gap menggunakan spektrum hasil karakterisasi Spektrofotometer *Ultraviolet-Visible* (UV-Vis). Untuk mengetahui aktivitas fotokatalitik Bi₂O₃/Fe dilakukan uji fotodegradasi untuk degradasi *Amoxicillin*, diperoleh aktivitas fotokatalitik paling optimal pada material Bi₂O₃ doping Fe 3% dengan laju degradasi material yaitu sebesar 0,0079 menit⁻¹, dan efisiensi degradasi yaitu sebesar 76,00%.

Kata kunci : Bi₂O₃/Fe, Iradiasi *Microwave*, Fotodegradasi, *Amoxicillin*

Effect of Fe Doping on Characteristics and Activity of Bi₂O₃ Photocatalytic for Amoxicillin Degradation

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Abstract

Research on Fe doped Bismuth Oxide (Bi₂O₃/Fe) material synthesized using the precipitation method assisted by microwave radiation has been done. This study aimed to analyze the effect of Fe on the characteristics of Bi₂O₃ and analyze its ability to degradation of amoxicillin. The addition of Fe was carried out with various concentrations, namely 0%, 1%, 3%, 5%, 7% and 9%, respectively. The synthesis results were characterized using X-Ray Diffraction (XRD) to determine the structure and size of crystal. Then characterized using Scanning Electron Microscopy-Energy Dispersive X (SEM-EDX) to determine the morphology, particle size, and chemical elements contained in the material. In addition, the energy gap was measured using the spectrum characterization of the Ultraviolet-Visible (UV-Vis) Spectrophotometer. To determine the photocatalytic activity of Bi₂O₃/Fe, a photodegradation test was carried out for Amoxicillin degradation, the most optimal photocatalytic activity was obtained in 3% Fe doped Bi₂O₃ material with a material degradation rate of 0.0079 min⁻¹, and a degradation efficiency of 76.00%.

Keywords: Bi₂O₃/Fe, Microwave Irradiation, Photodegradation, Amoxicillin

Pembimbing Akademik

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