

PREPARASI NANOKOMPOSIT Fe₃O₄/TiO₂ SEBAGAI FOTOKATALIS UNTUK DEGRADASI NITROBENZENA

Mardiansyah

15/383298/PA/16958

INTISARI

Penelitian tentang preparasi nanokomposit Fe₃O₄/TiO₂ sebagai fotokatalis untuk degradesi nitrobenzena telah dilakukan. Tujuan dilakukan penelitian ini adalah mendapatkan material Fe₃O₄/TiO₂ serta mengetahui aktivitasnya sebagai fotokatalis untuk degradasi nitrobenzena. Material hasil preparasi dikarakterisasi dengan spektrofotometer *Fourier Transform Infrared* (FT-IR), *X-Ray Diffractometer* (X-RD), *Scanning Electron Microscope Energy Dispersive X-ray* (SEM-EDX), *Transmission Electron Microscope* (TEM), *Specular Reflectance Ultra Violet-Visible* (SR UV-Vis) *Spectrophotometer*. Uji aktivitas material Fe₃O₄/TiO₂ dilakukan pada degradasi nitrobenzena dengan paparan sinar UV serta dilakukan pengujian stabilitas melalui penggunaan kembali material fotokatalis Fe₃O₄/TiO₂. Produk hasil degradasi nitrobenzena dianalisis menggunakan metode spektrofotometri UV-Vis.

Hasil penelitian menunjukkan bahwa preparasi Fe₃O₄/TiO₂ berhasil dilakukan. Material Fe₃O₄/TiO₂ memiliki sifat magnetik sehingga dapat dipisahkan dari media cair menggunakan batang magnet eksternal. Aktivitas fotokatalis optimum terjadi pada pH 7 selama 120 menit dengan persentase degradasi sebesar 69,40%. Material Fe₃O₄/TiO₂ yang diperoleh stabil sampai empat kali penggunaan sebagai fotokatalis.

Kata kunci: degradasi, Fe₃O₄/TiO₂, fotokatalis, nitrobenzena.

PREPARATION-OF Fe₃O₄/TiO₂ NANOCOMPOSITE AS A PHOTOCATALYST FOR NITROBENZENE DEGRADATION

Mardiansyah

15/383298/PA/16958

ABSTRACT

Research on the preparation of Fe₃O₄/TiO₂ nanocomposite as a photocatalyst for nitrobenzene degradation has been done. The aims of this research was to obtain Fe₃O₄/TiO₂ material and to evaluate for the degradation of nitrobenzene. The prepared material was characterized by using Fourier Transform Infrared (FT-IR) spectrophotometer, X-Ray Diffractometer (X-RD), Scanning Electron Microscope-Energy Dispersive X-ray (SEM-EDX), Transmission Electron Microscope (TEM), Specular Reflectance Ultra Ultra Violet-Visible (SR UV-Vis) Spectrophotometer. The activity of Fe₃O₄/TiO₂ material was examined for nitrobenzene degradation under UV light exposure and the stability of material was also tested by reusing the photocatalyst. Nitrobenzene degradation result was analyzed using a UV-Vis spectrophotometer.

The results showed that Fe₃O₄/TiO₂ was successfully prepared. The Fe₃O₄/TiO₂ material had magnetic properties so that it could be easily separated from aqueous media using an external magnetic bar. Optimum photocatalytic activity was obtained at pH 7 for 120 minutes with the percentage of degradation was 69.40%. The Fe₃O₄/TiO₂ material obtained was also stable until it was used four-times as photocatalyst.

Keywords: degradation, Fe₃O₄/TiO₂, nitrobenzene, photocatalyst.