

**BENTONIT TERMODIFIKASI MAGNETIT BERBASIS METODE
KOPRESIPITASI SEBAGAI ADSORBEN Cr(III) DALAM LARUTAN
BERAIR**

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INTISARI

Penelitian bentonit termodifikasi magnetit berbasis metode kopresipitasi telah dilakukan untuk mempelajari metode sintesis bentonit magnetik serta aplikasinya sebagai adsorben Cr(III). Penelitian ini dilakukan aktivasi bentonit dengan HCl dan sintesis bentonit termodifikasi magnetit dengan menggunakan campuran larutan $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ dan $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ serta penambahan NH_4OH hingga pH 11 yang direaksikan pada suhu 85°C . Hasil bentonit termodifikasi magnetit dikarakterisasi menggunakan XRD (*X-ray Diffraction*) dan FTIR (*Fourier Transform Infra Red*).

Hasil karakterisasi bentonit menunjukkan mineral yang terkandung adalah monmorilonit, kuarsa, *K-feldspar*, kristobalit, dan illit. Bentonit teraktivasi dan bentonit magnetik hasil sintesis digunakan sebagai adsorben Cr(III). Waktu optimum bentonit teraktivasi dan bentonit magnetik terhadap Cr(III) telah ditentukan. Jumlah ion Cr(III) (10 mg L^{-1}) yang diadsorpsi bentonit teraktivasi ($0,01 \text{ g}$) setelah 60 menit adalah $8,23 \text{ mg g}^{-1}$ dan bentonit magnetik setelah 5 menit adalah $9,49 \text{ mg g}^{-1}$. Data adsorpsi bentonit teraktivasi dan bentonit magnetik yang diperoleh mengikuti kinetika model orde dua semu Ho dan McKay dan isoterm Freundlich. Pengujian *recovery* dengan medan magnet eksternal pada adsorben bentonit termodifikasi magnetit dapat dilakukan dengan mudah dan cepat.

Kata kunci: bentonit, magnetit, adsorpsi, Cr(III)

MAGNETIZED BENTONITE BASED CHEMICAL COPRECIPITATION METHOD AS ADSORBENT FOR Cr(III) REMOVAL FROM AQUEOUS SOLUTION

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ABSTRACT

Modified magnetite of bentonite based chemical coprecipitation have been studied about method of magnetized bentonite synthesis and its application as an adsorbent Cr(III). The research was conducted with HCl activation of bentonite and modified bentonite synthesis of magnetite by using a mixture solution of $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ and the addition of NH_4OH to pH 11 were reacted at a temperature of $85\text{ }^\circ\text{C}$. Results magnetized bentonite were characterized using XRD (*X-ray Diffraction*) and FTIR (*Fourier Transform Infra Red*).

The characterization of bentonite indicate content mineral of bentonite were montmorillonite, quartz, K-feldspar, cristobalite, and illite. Activated bentonite and magnetic bentonite were used as an adsorbent Cr(III). The optimum time of activated bentonite and magnetic bentonite to Cr(III) has been determined. The amount of Cr(III) (10 mg L^{-1}) were adsorbed on the activated bentonite (0.01 g) after 60 minutes was 8.23 mg g^{-1} and a magnetic bentonite after 5 minutes was 9.49 mg g^{-1} . The experimental adsorption data of activated bentonite and magnetic bentonite followed pseudo-second-order kinetic model of Ho and McKay and Freundlich isotherm. Recovery testing with an external magnetic field on magnetized bentonite adsorbent can be done easily and fast.

Key words: bentonite, magnetite, adsorption, Cr(III)