

**SINTESIS KOMPOSIT HIDROTALSIT TERMODIFIKASI KITOSAN
DAN POTENSINYA SEBAGAI KATALIS HETEROGEN UNTUK
PEMBENTUKAN TURUNAN KALKON**

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INTISARI

Sintesis hidrotalsit, hidrotalsit kalsinasi, hidrotalsit rehidrasi, dan komposit hidrotalsit termodifikasi kitosan telah dilakukan menggunakan metode kopresipitasi menggunakan bahan dasar $Mg(NO_3)_2 \cdot 6H_2O$ dan $Al(NO_3)_3 \cdot 9H_2O$. Tahap awal dilakukan sintesis hidrotalsit dengan cara pengadukan pada suhu $65^\circ C$ selama 24 jam. Hidrotalsit yang diperoleh dikalsinasi pada suhu $450^\circ C$ selama 4 jam. Rehidrasi dilakukan dengan pengadukan fasa liquid dan sonikasi masing-masing selama 1 jam. Komposit hidrotalsit termodifikasi kitosan disintesis menggunakan metode kopresipitasi dengan mendispersikan hidrogel kitosan ke dalam matriksnya. Sintesis komposit dilakukan dengan prosedur yang sama, tanpa melalui tahapan rehidrasi. Elusidasi struktur hidrotalsit, hidrotalsit kalsinasi, hidrotalsit rehidrasi, komposit hidrotalsit termodifikasi kitosan, dan kitosan sebagai pembanding dilakukan menggunakan FT-IR, XRD, dan *Surface Area Analyzer*.

Hidrotalsit, hidrotalsit kalsinasi, hidrotalsit rehidrasi, komposit hidrotalsit termodifikasi kitosan memberikan pita serapan pada bilangan gelombang tertentu serta memiliki puncak karakteristik utama pada bidang d_{003} , d_{006} , d_{009} , dan d_{110} dengan intensitas dan sudut yang berbeda-beda. Berdasarkan analisis menggunakan BET, material-material tersebut mengikuti adsorpsi tipe ke IV dengan pola *hysteresis loop* tipe H3. Aktivitas katalitik dari hidrotalsit, hidrotalsit kalsinasi, hidrotalsit rehidrasi, dan komposit hidrotalsit termodifikasi kitosan diuji melalui sintesis senyawa turunan kalkon antara asetofenon dan *p*-anisaldehida melalui metode pengadukan selama 24 jam sehingga menghasilkan padatan berwarna kuning dengan titik leleh $72 - 73^\circ C$.

Kata kunci: hidrotalsit, kalkon, katalis, kitosan, komposit.

***SYNTHESIS OF HYDROTALCITE-MODIFIED CHITOSAN COMPOSITE
AND ITS POTENTIAL AS A HETEROGENOUS CATALYST FOR THE
FORMATION OF CHALCONE DERIVATIVE***

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ABSTRACT

Synthesis of hydrotalcite, calcined hydrotalcite, rehydrated hydrotalcite, and hydrotalcite-modified chitosan composite were conducted by coprecipitation method using $Mg(NO_3)_2 \cdot 6H_2O$ and $Al(NO_3)_3 \cdot 9H_2O$ as starting materials. Initial step was synthesizing hydrotalcite by mechanical stirring at 65 °C for 24 hours. Hydrotalcite was calcined at 450 °C for 4 hours. Rehydration was conducted by mechanical stirring in liquid phase and sonication, for 1 hour for each step. Hydrotalcite-modified chitosan composite was synthesized through coprecipitation method by dispersing chitosan hydrogel into its matrix. Synthesis of hydrotalcite-modified chitosan composite was conducted using same method before, exclusion of rehydration step. Structure elucidation of hydrotalcite, calcined hydrotalcite, rehydrated hydrotalcite, hydrotalcite-modified chitosan composite and chitosan as reference by FT-IR, XRD, and Surface Area Analyzer.

Hydrotalcite, calcined hydrotalcite, rehydrated hydrotalcite, and hydrotalcite-modified chitosan composite showed absorbance bands at certain wavelengths and had main characteristic peaks at d_{003} , d_{006} , d_{009} , and d_{110} planes with different intensities and angles. Analysis by BET showed that the materials had adsorption type IV with H3 type loop hysteresis. Catalytic activities of hydrotalcite, calcined hydrotalcite, rehydrated hydrotalcite, and hydrotalcite-modified chitosan composite were tested through synthesis of chalcone derivative between acetophenone and *p*-anisaldehyde by mechanical stirring method for 24 hours hence yellow solid was obtained with m.p of 72 – 73 C.

Keywords: catalyst, chalcone, chitosan, composite, hydrotalcite.