

Preparasi katalis camal-bentonit dan aplikasinya pada sintesa senyawa khalkon = The preparation and characterization camal bentonite catalyst and its application on chalcone synthesis

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Abstrak

Kalkon merupakan senyawa organik yang penting karena memiliki aktivitas biologis tertentu seperti anti-oksidan, anti-konvulsan, anti-bakteri, dll. Jumlah senyawa kalkon yang didapatkan dari hasil isolasi bahan alam sangat sedikit. Telah banyak upaya yang dilakukan untuk mendapatkan senyawa kalkon dan turunannya melalui jalur sintesis. Penelitian ini telah berhasil mensintesis senyawa kalkon dengan menggunakan katalis heterogen Ca@Al-Bentonit. Bentonit alam yang digunakan dalam penelitian ini, berasal dari daerah Bogor. Berdasarkan penentuan nilai Kapasitas Tukar Kation KTK, bentonit alam Bogor memiliki nilai KTK 35,84 meq/100 gram bentonit. Bentonit alam dipreparasi, dijenuhkan menjadi Na-Bentonit, dan dipilarkan menggunakan larutan pemilar polikation Al dengan rasio OH/Al 2,2. Al-Bentonit ini untuk kemudian diimpregnasi basah dengan 20 Ca₂ dari prekursor CaCl₂. Pola XRD Al-Bentonit 2θ = 4,6541o mengalami pergeseran ketika diimpregnasi basah dengan 20 Ca₂ 2θ = 4,8691o. Data tersebut diperkuat dengan data dari PSA dimana luas permukaan Al-Bentonit naik 29,58 setelah diimpregnasi dengan Ca₂. Data FTIR menunjukkan hal yang sama, terlihat puncak serapan pada bilangan gelombang 519,8 cm⁻¹ yang mengindikasikan adanya ikatan Ca-O setelah proses impregnasi. Berdasarkan hasil karakterisasi tersebut, disimpulkan Ca@Al-Bentonit berhasil disintesis. Katalis Ca@Al-Bentonit ini, kemudian dipelajari aktivitas katalitiknya pada reaksi sintesa senyawa kalkon. Reaksi dilakukan dengan variasi suhu RT, 45 °C, 60 °C, 75 °C, variasi massa katalis 10, 20, 30, 40, dan variasi lama waktu reaksi 6 jam, 12 jam, 18 jam, 24 jam dalam kondisi refluks. Berdasarkan hasil reaksi, diperoleh kondisi optimum pada suhu reaksi 75 °C; 40 massa katalis; dan lama waktu reaksi 24 jam dengan yield sebesar 6,290,0141 gram.

Chalcone is an important organic compound because it has certain biological activities such as anti oxidant, anti convulsant, anti bacterial, etc. The amount of Chalcone compound obtained from the isolation of natural materials are very low in yield. There have been many attempts made to obtain Chalcone compounds and its derivatives through the synthesis pathway. This research has succeeded in synthesizing Chalcone compound by using Ca Al Bentonite as heterogeneous catalyst. Natural bentonite which is used in this research comes from the Bogor region. Based on Cation Exchange Capacity CEC determination, Bogor 39 s natural bentonite has CEC value 35.84 meq 100 gram bentonite. Natural bentonite was prepared, saturated into Na Bentonite, and pillared with Al polycation solution with an OH Al ratio of 2.2. Al Bentonite is then wet impregnated with 20 Ca₂ of CaCl₂ precursors. The Al Bentonite XRD pattern 2θ 4.6541o undergoes a shift after being wet impregnated with 20 Ca₂ 2θ 4.8691o. The data was reinforced by data from PSA in which the Al Bentonite surface area increased by 29.58 after being impregnated with Ca₂. FTIR data show the same thing, seen the absorption peak at wave number 519,8 cm⁻¹ which indicate the existence of Ca O bond after impregnation process. Based on the results of the characterization, it was concluded that Ca Al Bentonite was successfully synthesized. This Ca Al Bentonite catalyst, then studied its catalytic activity in the synthesis reaction of the Chalcone compound. The reaction was carried out on

temperature variation RT, 45 °C, 60 °C, 75 °C , variation of catalyst mass percentage 10 , 20 , 30 , 40 , and variation of reaction time 6 hours, 12 hours, 18 hours, 24 hours under reflux conditions. Based on the reaction result, the optimum condition was obtained at the reaction temperature of 75 °C 40 mass of catalyst and 24 hours reaction time with the yield of 6.29 0.0141 gram .</i>