

Sintesis sinamaldehyda berbasis reaksi kondensasi aldol silang antara benzaldehyda dan asetaldehyda menggunakan katalis heterogen = Synthesis of cinnamaldehyde based on cross aldol condensation reaction of benzaldehyde and acetaldehyde over heterogeneous catalysts

Indo Aribinuko, author

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Abstrak

Sinamaldehyda merupakan salah satu produk bahan alam yang paling melimpah yang ditemukan pada kulit kayu spesies *Cinnamomum* dan terkenal karena aplikasinya dalam medis, pemberi cita rasa, industri parfum, dan sebuah intermediet berharga untuk banyak produk organik sintesis. Pada penelitian ini, sinamaldehyda disintesis dengan reaksi katalitik homogen dan heterogen. Reaksi katalitik homogen dilakukan menggunakan larutan NaOH, sedangkan reaksi katalitik heterogen dilakukan menggunakan beberapa katalis padatan basa, yang mana katalis NaOH/Al₂O₃ yang dipreparasi dengan mencampur dan menggerus padatan NaOH dan Al₂O₃ (14 % berat Al₂O₃) telah sukses menampilkan reaksi kondensasi aldol silang dalam menghasilkan sinamaldehyda. Katalis yang telah disiapkan dikonfirmasi dengan metode XRD. Reaksi kondensasi aldol antara benzaldehyda dan asetaldehyda dilakukan pada 70 oC dengan memvariasikan waktu reaksi. Produk reaksi dianalisis dengan GC dan GC-MS. Konsentrasi katalis = 3,5 % (% berat total reagen); rasio molar antara benzaldehyda dan asetaldehyda = 1,1:1; dan waktu reaksi 6 jam; distribusi produk sinamaldehyda yang didapat 8,06 %.

.....Cinnamaldehyde is one of the most abundant natural product found in *Cinnamomum* sp. bark and is well known for its application in medicine, flavor, perfumery, and also a valuable intermediate compound for many synthesized organic products. In this research, cinnamaldehyde was synthesized by homogeneous and heterogeneous catalytic reactions. The homogeneous catalytic reaction was conducted using solution of NaOH, where as the heterogeneous catalytic reaction were conducted using some solid base catalysts, in which the catalyst NaOH/Al₂O₃ prepared by mixing and grinding solids of NaOH and Al₂O₃ (14 % of Al₂O₃ weight) has succeeded to perform the cross aldol condensation reaction of benzaldehyde and acetaldehyde in producing cinnamaldehyde. The catalyst prepared was confirmed by XRD method. The aldol condensation reaction of benzaldehyde and acetaldehyde were conducted at 70 oC by varying the reaction times. Reaction product was analyzed by GC and GC-MS. The catalyst concentration was 3,5 % (% weight of total reagents); molar ratio between benzaldehyde and acetaldehyde was 1,1:1; and time reaction was 6 hours; the distribution product cinnamaldehyde obtained was 8,06 %.