多孔化剤添加条件で合成した水酸化アンモニウム樹脂を用いる連続フローHenry反応

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Effects of Porogen and Cross-liking Degree in Preparation on Catalytic Activities of Quaternary Ammonium Hydroxide Resins

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Solid-base catalysis of quaternary ammonium hydroxide resins on continuous-flow Henry reactions between nitromethane and aromatic aldehydes was studied. We focused on effects of porosities and cross-linking degrees of supports to enhance catalytic activity, and carefully investigated on relationship among activity, amounts of porogens, and amounts of cross-linking agents. Although clear tendency could not be found among them, we successfully determined a superior polymer matrix giving high catalytic efficiency in the continuous-flow reaction at elevating substrate/active site (-NMe_3OH) value comparing with a commercially available ammonium resin (**A26**). To obtain longer catalyst lifetime per a reactor module, further investigations on increasing amounts of active sites were conducted by tuning amounts of chloromethylstyrene comonomer.

Keywords: Continuous-flow Reaction, Henry Reaction, Quaternary Ammonium Hydroxide Resin, Heterogeneous Base Catalyst

連続フロー条件下、Henry 反応に対する合成水酸化アンモニウム樹脂の触媒作用向上を目指し、多孔化剤、架橋化剤等助剤添加量と、モノマー比率を系統的に変え、その変化が連続フロー系での塩基触媒活性とリアクターモジュールあたりの耐久性に与える効果を詳細に検討した。助剤添加量と活性とに一義的な相関性は見られなかったが、最良の活性を示す樹脂（**QN-8-105**）を与える助剤量を決定することができた。官能基あたりで比較すると、この合成樹脂は市販の水酸化アンモニウム樹脂（**A26**）を大きく超える反応効率を示した。さらに、本添加量条件を基にスチレンに対する官能基前駆体コモノマーの比率を増やしたところ（**QN-8-105 (7/3)**）、リアクターモジュールあたりの耐久性を向上させることができた。