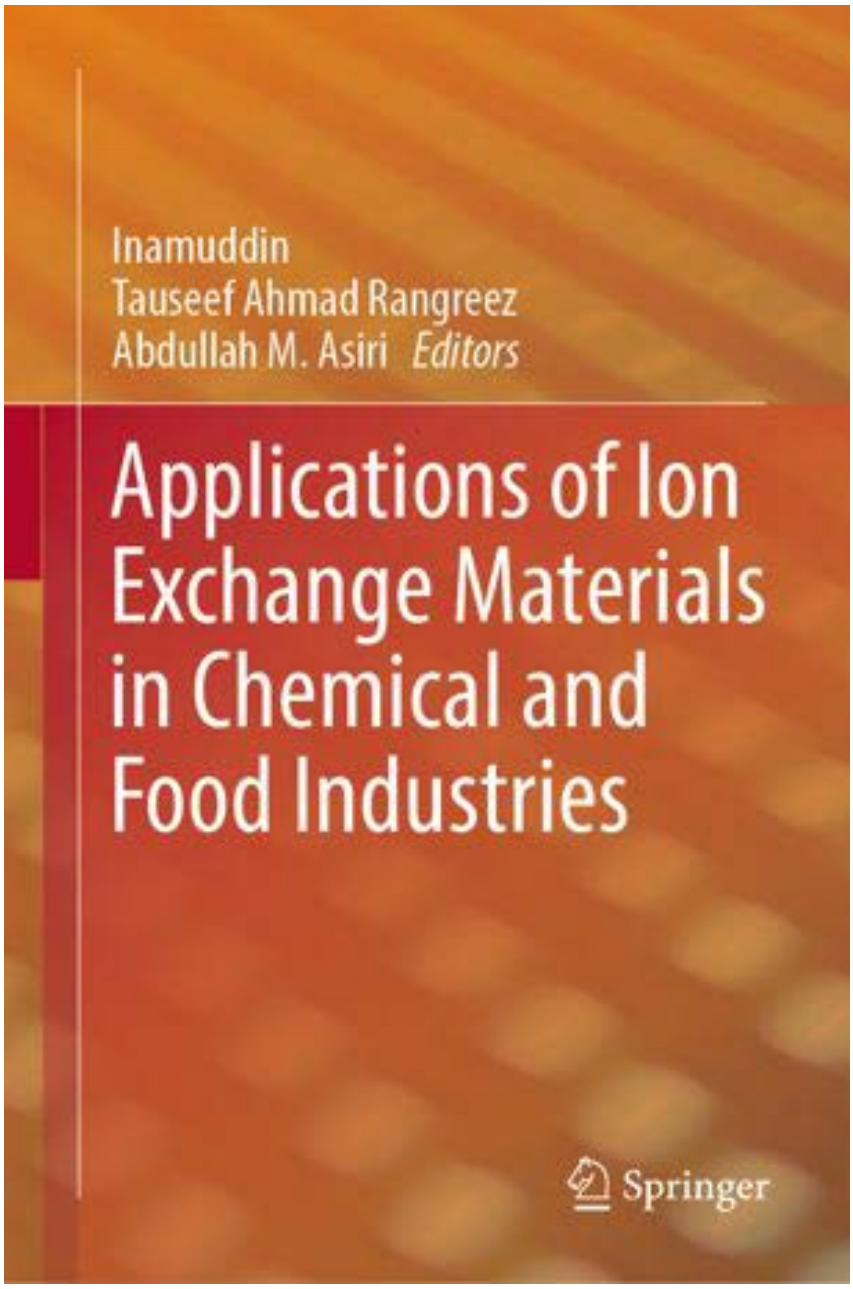

Applications of Ion Exchange Materials in Chemical and Food Industries

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Chapter 4
Ion Exchange Resins Catalysed Esterification for the Production of Value Added Petrochemicals and Oleochemicals

Sim Yee Chin, Nurwadiah Azizan, Mohd Amirul Asyraf Ahmad and Muhammad Ridzuan Kamaruzaman

Abstract This book chapter is formulated with the aim to review the literature relevant to the esterification reactions catalysed by strong acidic ion exchange resins. Priority has been given to the works that have been published during the last 15 years. Industrially important esterification reactions in the petrochemical and oleochemical industries have been delineated. Various types of strongly acidic ion exchange resins produced by different manufacturers have been used to accelerate the rate of esterification reactions. In the esterification reactions in both petrochemical and oleochemical industries, gel-type resins showed comparable activity with the macro-reticular type resins after swollen by the polar solvents during the reactions, otherwise the macroporous-type resins always performed better. Gel-type resins were also preferred, in particular, for the esterification reactions involved bulky reactant molecules due to the mass transfer restriction of the macro-reticular type resins. In contrast to the comprehensive studies on the activity of ion exchange resin in the esterification reactions, the works that are related to the reusability, recovery and regeneration of these resin catalysts are rather scarce. In order to scale up the esterification processes catalysed by strongly acidic ion exchange resins to the industrial level, future works should be focusing on the solutions to overcome of the aforementioned constraints and limitations.

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