

# Kinetic Studies of the Esterification of Acrylic Acid with 2-Ethyl Hexanol Catalysed by Diaion Resins

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## ABSTRACT

Homogenous acid catalysts are often used in industries producing acrylate esters. The separation of these catalysts from the reaction medium is difficult, in addition to their toxicity and corrosiveness. The heterogeneously catalyzed esterification that uses the poly(styrene-divinylbenzene) sulfonated resin as catalyst can overcome the drawbacks of homogeneous catalysts. In the present work, the activity and kinetic studies of a batch-wise esterification of acrylic acid (AA) and 2-ethylhexanol (2EH) catalyzed by DIAION acidic ion exchange resins were carried out. DIAION resin PK208 out-performed the other resins due to its comparative ion exchange capacity and low percentage of cross-linkage that enhance the accessibility of the reactant. PK208 was used subsequently in the kinetic studies. The highest yield of 2-ethylhexyl acrylate (2EHA) achieved was 41% after 4 h reaction at an initial reactant molar ratio of AA to 2EH of 1 : 3, catalyst loading of 10 wt% and temperature of 388 K. Eley–Rideal (ER) was the best kinetic model to correlate the production rate of 2EHA. Endothermicity of the AA esterification with 2EH was indicated by the increase of its equilibrium constant with temperature.

## KEYWORDS

PK208, Esterification, 2 Ethyl Hexyl Acrylate, 2 Ethyl Hexanol, Acrylic Acid

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