Esterification of fatty acids to biodiesel over polymers with sulfonic acid groups

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The esterification of palmitic acid with methanol was studied using poly(vinyl alcohol) cross-linked with sulfonic acid groups, as catalysts. The most active polymeric matrix (PVA-S04-40), an almost 95% equilibrium conversion was achieved after 2 h. Further, the optimisation of reaction parameters, such as, catalyst loading, molar ratio alcohol to fatty acid and type of alcohol was carried out with PVA-S04-40 catalyst. Catalytic stability of the PVA-S04-40 was evaluated by performing consecutive batch runs with the same catalyst sample. After the second batch, a stabilisation of the catalytic activity was observed. In order to become the biodiesel totally biogenerated, the esterification of palm oil was carried out with methanol, at 60 °C. It was observed that the reaction rate is slower when the reaction is carried out with methanol, at 60 °C.