Acid-Catalyzed Dehydration of Glycerol to Acrolein and Acrylic Acid.

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Introdução

Biodiesel is a major biofuel used in Brazil, with a mandatory blend of 7% in the regular petrodiesel in the present days. It is normally produced through the basic-catalyzed transesterification of oils and fats with methanol [1], affording glycerol as byproduct in approximately 10 wt%.

This surplus of glycerol coming from the biodiesel production has motivated new uses, especially as a renewable feedstock for the chemical industry [2].

Acrolein can be produced in high selectivity upon the acid-catalyzed dehydration of glycerol to acrolein and acrylic acid over catalysts based on niobium, as well as mesoporous silica-alumina materials.

Resultados e Discussão

Scheme 1. Acid-catalyzed dehydration of glycerol to acrolein.

We studied the dehydration of glycerol over two families of heterogeneous acid catalysts: niobium-based and mesoporous silica-alumina. The first family involved the impregnation of metals, such Co, Mo and V over niobium oxide (niobic acid) and niobium phosphate. The second family involved the synthesis of mesoporous MCM-41 silica-alumina materials.

Conclusões

Acrolein can be produced in high selectivity upon the acid-catalyzed dehydration of glycerol. Some selected catalysts presented slow deactivation and were also selective to acrylic acid.

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