Easy Ssynthesis of Ppolyesters with Ssolid Aacid Ceatalysts

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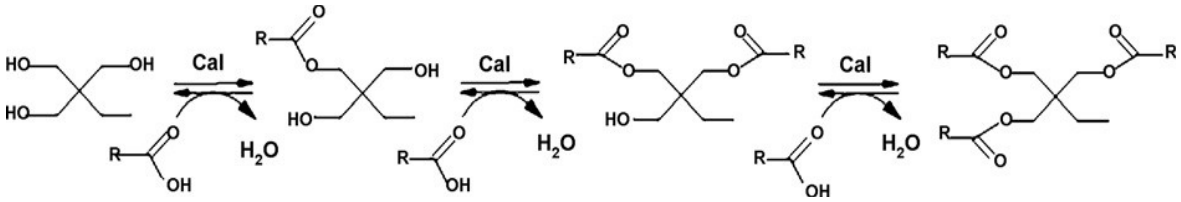
World lubricants consumption is estimated to be around 40 million metric tonnes per year. Automotive and hydraulics are the largest group of sold and used lubricant in the world. About 50% of all sold lubricants are lost in environment, resulting in severe contamination of soil, groundwater and air [1]. As a result, there is an increasing demand for biolubricants derived from vegetable oils. This class of materials is renewable, biodegradable and can be used as an energy source at the end of lifeclycle, to limit the environmental impact [2].

Synthesis of biolubricants is based on the esterification reaction between fatty acids, derived from vegetable oils and polyols, like pentaerythrol (PE) or trimethylolpropane (TMP). The reaction is usually carried out with an homogeneous acidic catalyst (e.g., p-toluenesulfonic acid, mineral acids). In order to make the reaction more enviromentally friendly we here suggest the use of heterogeneous catalysis. The heterogeneous catalysts would provide simpler and cheaper separation processes, reduce or eliminate wastes production and in principle could be re-used until deactivation.



Scheme 1: Esterification reaction between TMP and a carboxylic acid

Some experiences in solid acid catalysts, using different modified silicas in order to catalyze the esterification reaction are here presented and discussed. Conversion yields up to 99 % in only 6 hours reaction, with selectivity up to 95% in triesters using a SiO_2-ZrO_2 were obtained. The catalyst can be recycled 6 times at least..

REFERENCES:

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