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Abstract: This paper describes experimental work done towards the search for more profitable and sustainable alternatives regarding biodiesel production, using heterogeneous catalysts instead of the conventional homogeneous alkaline catalysts, such as NaOH, KOH or sodium methoxide, for the methanolysis reaction. This experimental work is a first stage on the development and optimization of new solid catalysts, able to produce biodiesel from vegetable oils. The heterogeneous catalytic process has many differences from the currently used in industry homogeneous process. The main advantage is that, it requires lower investment costs, since no need for separation steps of methanol/catalyst, biodiesel/catalyst and glycerine/catalyst. This work resulted in the selection of CaO and CaO modified with Li catalysts, which showed very good catalytic performances with high activity and stability. In fact FAME yields higher than 92% were observed in two consecutive reaction batches without expensive intermediate reactivation procedures. Therefore, those catalysts appear to be suitable for biodiesel production. (C) 2010 Elsevier Ltd. All rights reserved.

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