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Synthesis and Characterization of Methyl Esters from Non-edible Plant Species Yellow oleander Oil, using Magnesium oxide (MgO) Nano-catalyst

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Highlights

- Introduction of new non-edible oil source for bioenergy industry
- Nano-particles MgO used as a heterogeneous catalyst
- Maximum conversion yield at optimum level achieved 93.1%
- Fuel properties were matched and found similar to ASTM standards

Abstract

Synthesis and characterization of methyl esters from non-edible oil sources provide a distinctive and sustainable approach towards sustainable energy and the cleaner environment, in general. This study aims the synthesis of methyl esters from non-edible plant species yellow oleander seeds oil. The transesterification process was carried for the synthesis of methyl esters, using heterogeneous nano-catalyst magnesium oxide (MgO). A well known co-precipitation method was used for the synthesis of MgO nano-catalyst. The application of MgO nano-catalyst showed the maximum conversion (93.1%) of triacylglycerols to methyl esters. Different parameters affecting the conversion percentage; alcohol to oil molar ratio, temperature and catalyst concentrations were checked and