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# Experimental studies on the liquid thermal conductivity of three saturated fatty acid methyl esters components of biodiesel

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**Abstract:** One of the attempts to reduce the consumption of fossil fuels is to replace them with renewable and clean fuels. Among these fuels, biodiesel has been considered as a promising alternative to petroleum diesel fuel. Thermal conductivity of biodiesel is a very important thermophysical property for its applications. In this work, the liquid thermal conductivity of three saturated fatty acid methyl esters(methyl myristate, methyl laurate and methyl caprate), usually the significant biodiesel components, was measured with the temperature ranging within (304 to 402) K, (283 to 402) K, (267 to 400) K, respectively. The total standard uncertainty of the experimental results was estimated to be less than 2 % and the repeatability was better than  $\pm 0.5$  %. The thermal conductivity data of each substance were fitted as a function of temperature, and the average absolute relative deviation and maximum absolute relative deviation between the experimental data and calculated results were 0.13 % and 0.44 % for methyl myristate, 0.21 % and 0.53 % for methyl laurate, 0.28 % and 0.80 % for methyl caprate, respectively.

**Keyword:** Biodiesel; Fatty acid methyl esters; Thermal conductivity

## 1. Introduction

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