Thermal Conductivity of Liquid Diethyl Ether, Isopropyl Ether and Butyl Ether from 243 to 373 K at Pressures to 30 MPa

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Diethyl ether, isopropyl ether and butyl ether are regarded as good fuel additives and potential alternative fuels in the future as a result of their high oxygen content, suitable boiling point, and solubility in diesel fuel. However, although more and more researchers are investigating these compounds at present, to the best of our knowledge, thermal conductivity data of diethyl ether, isopropyl ether and isopropyl ether are scarce. As ideal fuel additives, hence, there is an urgent need for the experimental values at high pressures. In this work, the thermal conductivity of liquid diethyl ether, isopropyl ether and butyl ether were measured from 233 to 373 K while pressures ranged from (0 to 30) MPa by use of the transient hot-wire technique with anodized tantalum hot wires. The experimental data were correlated as a function of pressure and temperature. The uncertainty of the thermal conductivity was ±2.0 % with a coverage factor of $k = 2$.