

In the current article, the experimental measurement of thermal conductivities for non-Newtonian polymeric fluids has been performed over a wide range of polymer concentrations. Measurements of the thermal conductivity for three Newtonian fluids and three different groups of non-Newtonian polymeric aqueous fluids (twenty-four polymeric solutions) under static conditions are conducted using the cell of concentric cylinders with the annular gap of 0.4 mm. Various polymer concentrations ranged from 100 ppm to 5000 ppm by weight are implemented in the experiments with temperature changed from 20 °C to 50 °C. Accordingly, the impact of relevant non-Newtonian fluid parameters, such as polymer concentrations, polymer types and molecular weights as well as the kind of solvents on the thermal conductivity of non-Newtonian fluids were systematically tested. The experimental results of thermal conductivity for the Newtonian fluids (distilled water, 50 % methanol-50 % water and 50 % glycerin-50 % water) are in a reasonable agreement with the previously published data with the differences always being less than 4.5 %. Moreover, thermal conductivities of non-Newtonian polymeric solutions are approximately the same values of Newtonian fluids with the corresponding temperatures under rest condition and any fluctuation in the measured data is within the permissible error uncertainty. Although, the addition of polymeric particles has the ability to turn the state of the fluid from Newtonian to non-Newtonian, there is no noteworthy influence on the thermal conductivity of these non-Newtonian fluids