EXPERIMENTAL INVESTIGATION OF VISCOSITY COEFFICIENT OF NANOFLUIDS

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There is an increasing interest in nanofluids in the last two decades. This is due to existing and possible future applications. Since nanofluid flows usually occur in applications, the their viscosity plays a decisive role. Discussions are still ongoing, despite the considerable experimental data (see, for example, the reviews [1–4]). The contradiction associated with question depends on whether the viscosity of nanofluids on particles size and, if so, how [4].

The paper presents the results of experimental study of viscosity coefficient of nanofluids. The several tens of nanofluids based on water, ethylene glycol and engine oil with particles SiO_2, Al_2O_3, TiO_2, ZrO_2, CuO, Fe_2O_3, Fe_3O_4, as well as diamond were studied. The volume concentrations of particles ranged from 0.1 to 8%. The their size was changed from 5 to 150 nm. Nanopowders were purchased from JSC "Plasmoterm" (Moscow) and LLC "Advanced powder technology" (Tomsk, Fe_3O_4, and CuO nanopowders). All nanofluids used in the described experiments were prepared by the so-called two-step method [5].

Measurement of viscosity coefficient of the nanofluid was carried out with the help of "Brookfield DV2T" rotational viscometer with interchangeable spindles. We used also a rotational viscometer OFITE-900. All measurements are performed at 25°C.

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