

## **Measurement thermal conductivity and thermal diffusivity of chromium nanofluids.**

### **ABSTRACT**

In this study, nanofluids of Chromium (Cr) in water, Ethylene Glycol and Ethanol have been prepared using single step method. The thermal conductivity and diffusivity of these nanofluids were measured via hot wire-photothermal deflection technique. Based on finite difference method (FDM) temperature distribution and photothermal deflection caused by the hot wire inside nanofluids was obtained. A numerical simulation of the heat conduction equation and probe beam deflection has been performed to determine the thermal conductivity and diffusivity of the nanofluids. By fitting the experimental data to the numerical simulation curve the thermal diffusivity and thermal conductivity of Chromium (Cr) in water, Ethylene Glycol and Ethanol were obtained. It is found that thermal conductivity and thermal diffusivity of Cr nanofluids in water, EG and Ethanol are higher than thermal conductivity and thermal diffusivity of respective base fluids.

**Keyword:** Chromium nanofluids; Thermal conductivity; Thermal diffusivity.