

An experimental investigation of electrical conductivity of $Y_3Al_5O_{12}$ -ethylene glycol nanofluid

JACEK FAL¹, ADAM WITEK², MAGDALENA GIZOWSKA², MARIAN CHOLEWA³, AND
GAWEL ŻYŁA¹

¹*Department of Physics, Rzeszów University of Technology, Rzeszów, Poland*
jacekfal@prz.edu.pl

²*Department of Biophysics, University of Rzeszow, Rzeszów, Poland*

³*Department of Nanotechnology, Institute of Ceramics and Building Materials,
Warsaw, Poland*

ABSTRACT

Paper presents experimental study of electrical conductivity of yttrium aluminum garnet–ethylene glycol ($Y_3Al_5O_{12}$ –EG, YAG–EG) nanofluids, which was prepared by dispersing commercially available $Y_3Al_5O_{12}$ nanoparticles manufactured by Baikowski (Annecy, France, ID LOT: 18513) in ethylene glycol using two-steps method.

The electrical conductivity was measured using conductivity meter MultiLine 3410 (WTW GmbH, Weilheim, Germany). In turn the temperature was stabilized in a water bath MLL 547 (AJL Electronic, Cracow, Poland). The electrical conductivity of YAG-EG nanofluids with various mass concentrations from 5% to 20% was investigated at different ambient temperatures. The experimental data indicate that changing volume fraction of YAG nanoparticles in ethylene glycol cause change of electrical conductivity of nanofluid. It was also observed that electrical conductivity depends on temperature of samples.