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VISCOSITY, DENSITY, AND THERMAL CONDUCTIVITY OF ALUMINUM OXIDE AND ZINC OXIDE NANOLUBRICANTS

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Highlights

- >Viscosity, density, and thermal conductivity measurements of nanolubricant for water chillers were presented.
- >Models capture the effects of nanoparticle size, nanoparticle and surfactant mass fraction, and temperature.
- >Viscosity model based on using nanoparticle size dependent pseudo surfactant and pseudo nanoparticle viscosities.
- >Maxwell equation modeled spherical nanoparticles conductivity successfully, while sphericity correction was used for non-spherical nanoparticles.

ABSTRACT

This paper presents liquid kinematic viscosity, density, and thermal conductivity measurements of eleven different synthetic polyolester-based nanoparticle nanolubricants (dispersions) at atmospheric pressure over the temperature range 288 K to 318 K. Aluminum oxide (Al_2O_3) and

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