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NANOFLUID BASED ON A NEW GENERATION OIL

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Magnetic fluids belong to special nanomaterials with many application possibilities. One of the fields of their use is the energy industry, where the demands on the performance of electrical equipment are constantly rising. As a result, there is a need to use modern insulation systems. Adding nanoparticles to conventional media could be one way to obtain them. In this study, we focused on the complex characterization of potential magnetic nanofluids based on isoparaffin hydrocarbons extracted from natural gas. These new generation gas-to-liquid (GTL) derived electrical insulation fluids are cleaner, chemically stable, and the thermal conductivity values of these electrical insulating fluids are higher, indicating improved heat transfer properties. For the preparation of magnetic nanofluids, we used sterically stabilized nanoparticles of iron oxide with a volume fraction in samples in the range of 0.3–3.0%. The saturation magnetization, magnetic susceptibility, density, and viscosity were investigated showing a significant enhancement with an increase of the volume fraction. Our experimental results show that the nanoliquid prepared on the basis of the GTL technology has a stable colloidal character that is necessary for its application as a potential cooling medium in electro-energetics.

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