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Title: Influence of chain length of long-chain fatty acid surfactant on the thermal conductivity of magnetite nanofluids in a magnetic field

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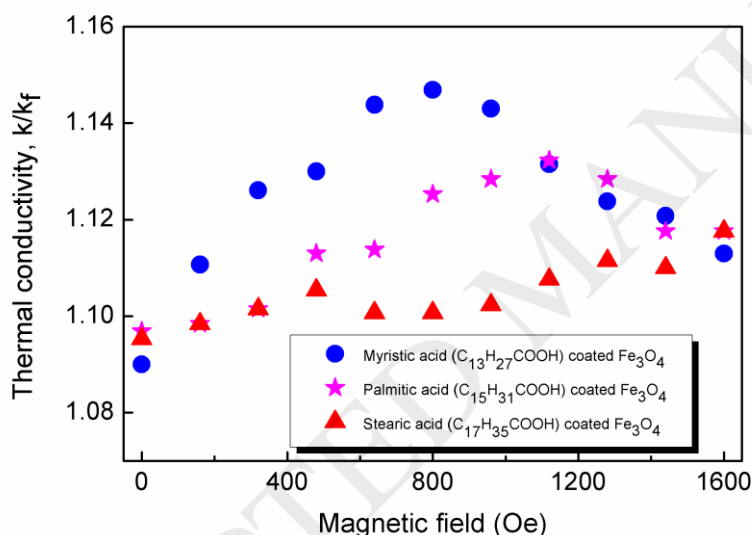
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Graphical abstract



ABSTRACT: Stable magnetic nanofluids are prepared by dispersing long-chain fatty acid surfactants coated magnetite (Fe₃O₄) nanoparticles in toluene and investigated the effect of chain length of the surfactant molecules on the thermal conductivity of the magnetite nanofluids in a magnetic field. Superparamagnetic magnetite nanoparticles having a comparable particle size (~10 nm) are coated with three different long-chain fatty acid surfactants; myristic acid (C₁₃H₂₇COOH), palmitic acid (C₁₅H₃₁COOH) and stearic acid (C₁₇H₃₅COOH). The thermal conductivity of the nanofluids, in a magnetic field, is found to decrease with increasing the chain length of the surfactant molecule. Among the three fluids,

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