Keeping It Cool with Nanoparticle Technology

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Keeping it Cool with Nanoparticle Technology This experiment studied the effects of a magnetic field on the heat conductivity of a ferrofluid interface. The hypothesis of this study was that application of an external magnetic field to a ferrofluid interface would shorten the equilibration time between two bodies of water of different temperatures by increasing the rate of heat transfer. An experimental model was engineered using commonly available materials to approximate a closed system. Temperature was monitored as heat was transferred from a heated body of water through the ferrofluid interface to a cooled body of water until thermal equilibrium was reached. The rates of heat transfer in Celsius degrees per minute were calculated in three successive trials, comparing magnetized ferrofluid with nonmagnetized ferrofluid. The primary endpoint of this experiment was the percent increase in the rate of heat transfer in a magnetized ferrofluid. This rate of increase was calculated at 186% and validates the initial hypothesis.

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