

# Magnetic and Heating Characteristics of various Oil-Based Magnetic Fluids

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The heating ability of magnetic fluids based on various transformer oils with different density of carrier liquid and different concentration of magnetite was studied. The calorimetric measurements were carried out in an alternating magnetic field up to 5 kA/m amplitude and of 500 kHz frequency. The revealed  $H^n$  law-type dependence of the temperature increase rate,  $(dT/dt)_{t=0}$ , on the amplitude of the magnetic field indicates the presence of superparamagnetic nanoparticles in the tested samples since  $n = 2$  for all samples. The specific absorption rate (SAR) defined as the rate of energy absorption per unit mass increases with a decrease of the volume fraction of the dispersed magnetite phase and carrier liquid density. This can be explained by the formation of aggregates in the samples with a higher concentration of magnetic particles.

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