

IJ-030 NON-ARRHENIUS TEMPERATURE DEPENDENCE OF MAGNETIC AFTER EFFECT

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The rate of magnetization change (magnetic after effect) which occurs after the magnetic field applied to a magnetic material is switched suddenly to a new value, is generally assumed to increase when the temperature is increased. Deviation from this temperature behavior, which has been observed in several cases, has been ascribed to changes in pertinent magnetic properties, such as magnetocrystalline anisotropy, activation volume, coercive field, etc., with temperature. We report here on the magnetic after effect temperature dependence of a magnetic recording material with magnetic properties that change very little with temperature over a wide temperature range but which, nevertheless, deviates considerably from a monotonic increase in decay rate with increasing temperature. We postulate that this behavior is explained by replacing the Maxwell-Boltzmann statistics by the Bose-Einstein statistics appropriate for the magnon energy distribution.