Effect of temperature on magnetic strength research paper

Magnetism is the ability of a material to exhibit attraction or repulsion of certain magnetic materials due to the presence of magnetic fields. Magnetism may be permanent or temporary depending on whether a material is a hard or soft magnetic material. Magnetism arises from the existence of small atom-like structures referred to as magnetic domains that, when aligned, cause the effect of magnetism to be pronounced in a magnetic material (Huebener, 135).

Magnetism depends on the alignment of domains and in the same direction. As such, increase in temperatures results in increased random movement of domains, and hence affecting their alignment. On the contrary, low temperatures lead to a reduced movement of domains and hence a fixed direction in their alignment. Changes in temperature may also result in permanent effect on the magnetism of a magnet. At a certain temperature, Curie temperature, a permanent magnet loses it magnetism. Research shows that the alignment of domains changes as this temperature is approached. As temperatures approach this temperature, they tend to become less aligned. This means a decrease in magnetism before the material finally becomes paramagnetic (Narlikar, 346).

Paramagnetic materials have a very low susceptibility to magnetism. This means that they do not easily respond to exposure to magnetic field. Experiments have been carried to determine Curie point of different magnets. Additionally, such experiments aim at determining the changes in magnetism that occur before and after reaching this critical temperature. Such an experiment may be founded on the hypothesis that cooler temperatures result in increase in magnetic field strength while higher temperatures result in decrease in magnetic field strength. This is due to the

misalignment of domains that comes with increase in temperatures. This means that magnetism is a dependent variable that is dependent on changes in temperature.

Results obtained in experiments that have been carried out have enabled graphs to be plotted to prove these said theories. A simple set up would involve subjecting two magnets of equal magnetic strength to different extreme temperatures, low and high. Alternatively, the same magnetic rod can be subjected to changes in temperature starting from extremely low temperature until the Curie temperature is reached. The magnet should be set to attract iron fillings that have been weighed such that changes in their weight can be used as a measure of the changes in strength of the magnetic field strength (Falgarone, 745).

The experiment should involve negative temperatures to allow their increase up to the zero value and again from zero value to the Curie temperature. Results may be tabulated for the increase or decrease in weight of the iron fillings depending on whether more are attracted due to increase in magnetic field strength or deposited due to loss of magnetic strength.

Results from several experiments that have been carried out by physicist show that there is a reduction in the weight of iron attracted as temperature in increased from a negative value up to the zero temperature value. Magnetism increases with cooler temperatures.

The experiment shows that magnetic field strength is stronger at lower temperatures due to a fixed domain direction hence increase magnetism. Similarly, increase in temperatures result in misalignment of magnetic domains. This leads to loss in magnetic field strength at high temperatures.

However, this effect of increased temperature on reduction in magnetism is

observable up to the Curie temperature (Ozoe, 145). This is a critical temperature at which a permanent magnet completely losses it magnetism. Beyond the Curie temperature, a magnetic exhibits little or no magnetic properties.

Works Cited

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