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Diamagnetic, Paramagnetic and Ferromagnetic Substances.

Diamagnetic Substances: — Diamagnetic substances are those which become weakly magnetised in a direction opposite to that of the applied field. Bismuth, Antimony, Gold, Water, Alcohol, Quartz, Hydrogen, Copper, Zinc, Mercury, Nitrogen, Silver and Carbon are examples of such substances.

When a bar of diamagnetic is placed in a magnetic field, the flux density B in it is less than the flux density in the free space. The relative permeability μ_r is less than 1. B is small and negative quantity.

Paramagnetic Substances: — Paramagnetic substances are those which, when placed in a strong magnetic field, become weakly magnetised in the same direction of the external field. Platinum, ~~aluminium~~

Aluminium, chromium, Manganese, copper Sulphate, Liquid oxygen and solution of ~~the~~ salts of iron and nickel are the examples of paramagnetic substances.

Ferromagnetic Substances:—

Ferromagnetic substances are those which are strongly magnetised by relative weak magnetic field and in the same sense as the applied magnetic field. Iron, nickel, cobalt, Gadolinium and their alloys are ferromagnetics.

Ferromagnetics show all the properties of paramagnetics to a much higher degree. The flux density B in a ferromagnetic substance is not directly proportional to the magnetising force H . Thus μ is not a constant. μ of such substances decreases with rise in temperature and becomes practically equal to μ_0 at Curie temperature.

Above Curie temperature it becomes paramagnetic.