

Ferromagnetism is the basic mechanism by which certain materials (such as iron) form permanent magnets, or are attracted to magnets. In physics, several different types of magnetism are distinguished. Ferromagnetism (including ferrimagnetism) is the strongest type: it is the only one that typically creates forces strong enough to be felt, and is responsible for the common phenomena of magnetism in magnets encountered in everyday life. Substances respond weakly to magnetic fields with three other types of magnetism, paramagnetism, diamagnetism, and antiferromagnetism, but the forces are usually so weak that they can only be detected by sensitive instruments in a laboratory. An everyday example of ferromagnetism is a refrigerator magnet used to hold notes on a refrigerator door. The attraction between a magnet and ferromagnetic material is “the quality of magnetism first apparent to the ancient world, and to us today”.

Permanent magnets (materials that can be magnetized by an external magnetic field and remain magnetized after the external field is removed) are either ferromagnetic or ferrimagnetic, as are the materials that are noticeably attracted to them. Only a few substances are ferromagnetic. The common ones are iron, nickel, cobalt and most of their alloys, some compounds of rare earth metals, and a few naturally occurring minerals, including some varieties of lodestone (magnetite is considered ferrimagnetic, rather than ferromagnetic).

Ferromagnetism is very important in industry and modern technology, and is the basis for many electrical and electromechanical devices such as electromagnets, electric motors, generators, transformers, and magnetic storage such as tape recorders, and hard disks.

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