UNIT – 3
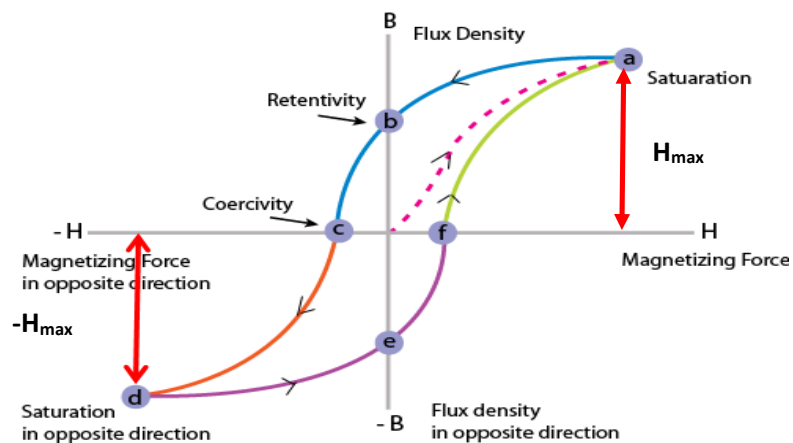
MAGNETIC PROPERTIES OF MATERIALS

3.5. Hysteresis

When a magnetic material is taken through a cycle of magnetization, the variation of magnetic induction (B) with respect to magnetic field intensity (H) can be represented by a closed curve. In other words, the lagging of magnetization behind the magnetizing field is known as hysteresis curve.

Fig:3.23

- In the curve OA magnetization is due to the small movement of domain wall.
- When the magnetic field is removed it returns to original position. It is reversible domain.
- In the curve AB the magnetization is due to the large movement of domain wall.
- When the magnetic field is removed it does not return to original position. It is irreversible domain.
- In the curve BC the magnetization is due to the rotation of domain.
- When the magnetic field is removed it does not retrace the path but it moves along CD.

- At D it has residual magnetization even when the magnetic field is zero called retentivity.

- A large amount of reverse field is applied to reduce the magnetization to zero, this reverse field is called coercive field.

3.5.3. Energy Product

A product of retentivity and coercivity is called energy product, which gives the maximum amount of energy stored in the specimen.
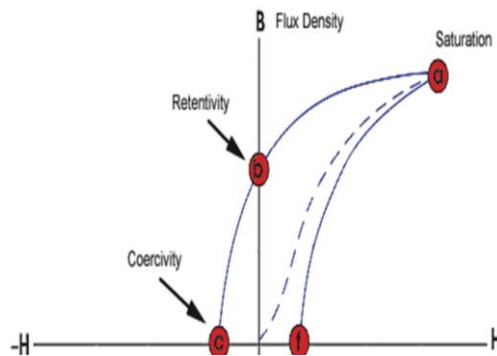

Fig:3.25

3.5.4 Hysteresis loss

When the specimen is taken through a complete cycle of magnetization, there is a loss of energy in the form of heat. This loss of energy is known as hysteresis loss.