

Investigating electromagnetic induction

Transcript

An electromotive force can be induced by a magnetic field. This is called electromagnetic induction which can be demonstrated using a galvanometer.

A wire is connected to a galvanometer. This is a sensitive instrument capable of detecting small currents.

An electromotive force, or e.m.f. is induced when the wire is moved through the magnetic field.

This produces a current through the wire which is detected by the galvanometer.

When the wire is moved in the opposite direction the induced e.m.f. is reversed. This causes the current to flow in the other direction.

An e.m.f. is induced due to the changing magnetic flux.

A coil is formed by winding 20 turns of wire around a cardboard tube.

An e.m.f. is induced when a bar magnet is moved into the coil of wire.

This produces a current through the coil of wire.

No e.m.f. is induced when the magnet is stationary within the coil.

As the magnet is moved towards and away from the coil, the induced e.m.f. alternates between positive and negative values.

This time the magnet is held stationary and the coil of wire is moved over the magnet.

Once more an e.m.f. is induced and produces a current. This demonstrates that it is the movement of the wire and magnet field relative to one another that causes the e.m.f. to be induced.

Any factor that affects the rate of change of magnetic flux linkage will affect the magnitude of the induced e.m.f. Further experiments could be carried out to investigate the effect of these.

This experiment has demonstrated how an e.m.f. can be induced due to the movement of a wire and a magnet, relative to one another.

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