

Self induction

Self - induction of a coil:

$$\Phi = L I$$

Φ – magnetic flux through a coil (Wb)

L – inductance of a coil (H, henry)

I – current flowing through a coil (A)

$$U_i = - d\Phi / dt = - L (dI / dt)$$

U_i – induced electromotoric p.d. of a coil (V)

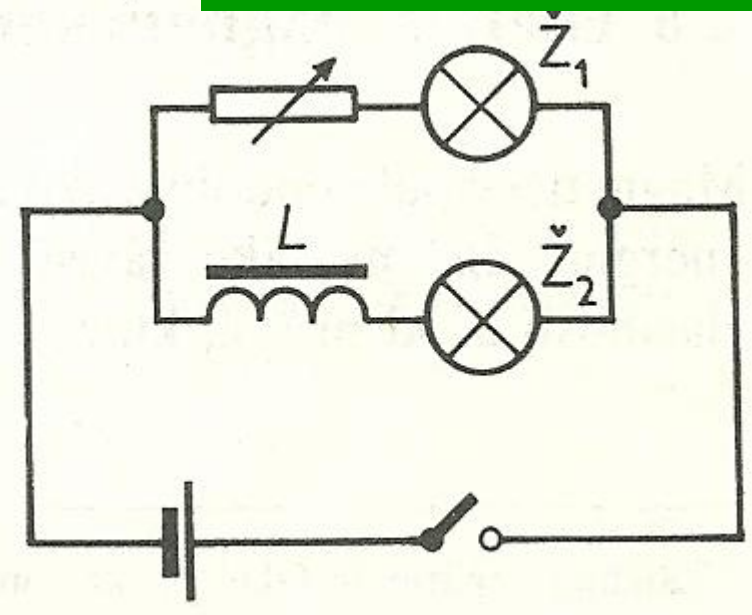
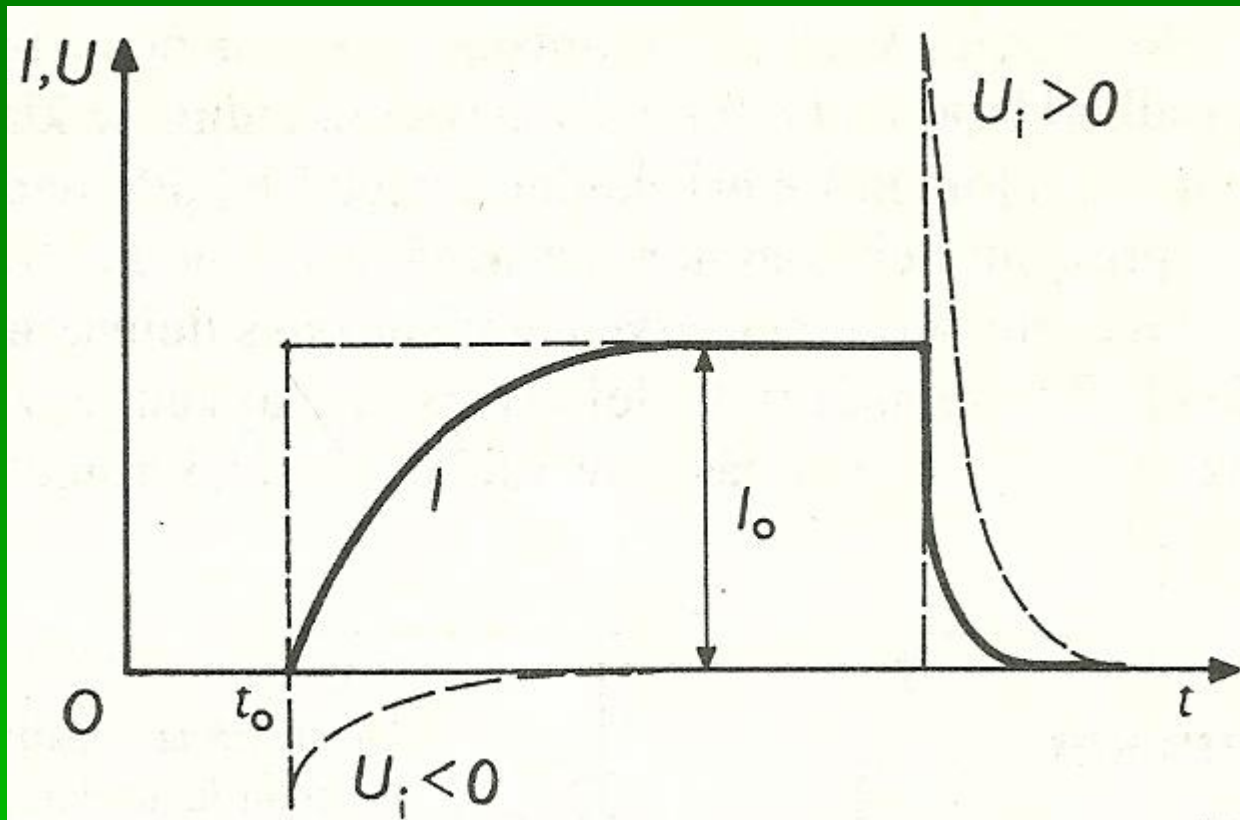
Current flowing through a circuit with a coil:

$$I = (U_e + U_i) / R = (U_e - L (dI / dt)) / R$$

U_e – voltage on the source (V)

$-L (dI / dt)$ – induced electromotoric p.d. of a coil

$-R$ – total resistance of the circuit (Ω)



•A current in a coil was reduced by 1.8A in 0.2s. What was the inductance of the coil, if the induced electromotive p.d. in it was 45 mV?

•In 0.6s there was induced electromotive p.d. of 0.3V in a coil with inductance of 0.12H. Calculate magnitude of change of current in this time.

•What was the speed of change of current in a coil with inductance of 2.3H, if there was induced electromotive p.d. of 250V in it?