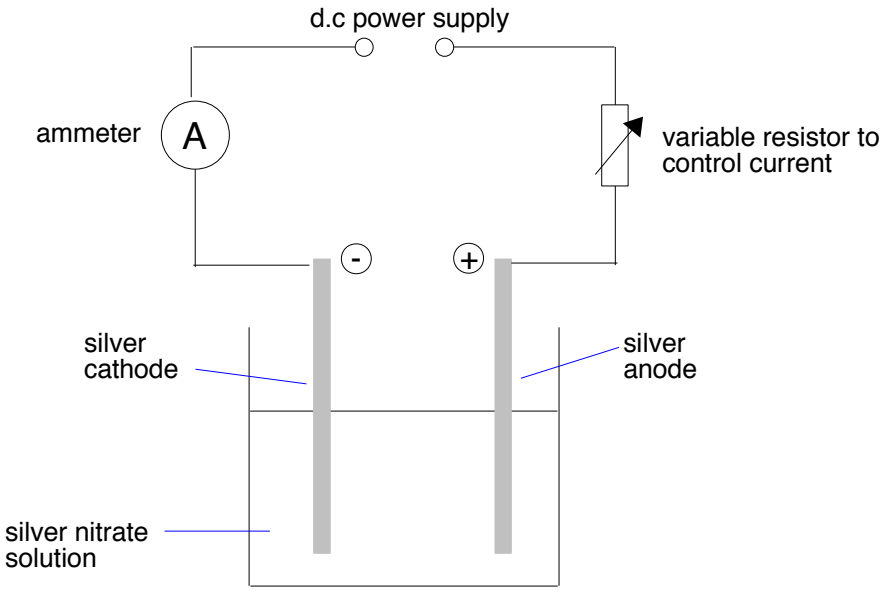
MORE ELECTROLYSIS CALCULATIONS

1. a)



You would also need a stopwatch or other timer.

(Important! You are measuring the current and so you need an ammeter – NOT a voltmeter.)

Method:
Clean the silver anode carefully and then weigh it.
Connect up the circuit, and adjust the current to be exactly 0.250 amps, and maintain it at that for exactly 30 minutes.
Switch off the current and remove the anode.
Wash the anode with pure water, and then with propanone, and then leave it to dry in the air.
Reweigh the anode.

b) $Ag_{(s)} \longrightarrow Ag^{+}_{(aq)} + e^{-}$

c) number of coulombs = current in amps x time in seconds = 0.250 x 30 x 60 = 450

d) number of moles of silver lost = 0.504/108 = 4.67×10^{-3}

e) 1 mole silver lost from the anode releases of 1 mole of electrons at the anode, and so 4.67×10^{-3} moles of silver releases 4.67×10^{-3} moles of electrons.

That must be equivalent to the 450 coulombs we have just calculated in part d).

So 1 mole of electrons (1 faraday) must be equivalent to $450/4.67 \times 10^{-3} = 96400$ coulombs.

f) How many times does 1.60×10^{-19} go into 96400? $96400/1.60 \times 10^{-19} = 6.03 \times 10^{23}$

That's the Avogadro number.