BASIC ELECTROLYSIS CALCULATIONS

1. Nickel(II) sulphate solution was electrolysed using a carbon anode and an iron key as the cathode. A nickel coating was formed on the key, and oxygen was given off at the anode.

   a) Write the cathode equation.

   b) What mass of nickel would be deposited on the iron key if a current of 0.30 amps flowed for 15 minutes? ($F = 96500$ C mol^{-1}; A_r Ni = 58.7)

   c) Write the anode equation.

   d) What volume of oxygen measured at rom temperature and pressure would be produced in the same time? (Molar volume of a gas at rtp =24 dm^3 mol^{-1})

2. a) Suppose you electrolysed dilute sulphuric acid using inert electrodes in a piece of apparatus that enabled you to collect the gases produced over water into measuring cylinders. How long would it take you to fill a 100 cm^3 measuring cylinder with hydrogen if you used a current of 2.0 amps, everything being done at room temperature?
   ($F = 96500$ C mol^{-1}; molar volume of a gas at rtp =24 dm^3 mol^{-1})

   b) What current would you have to use in order to fill the measuring cylinder in exactly 5 minutes?

What you need to do now is to practise the electrolysis calculations set by your examiners, checking your answers against their mark schemes.