GCSE Chemistry B (Twenty First Century Science)

J258/02 Depth in chemistry (Foundation Tier)

Question Set 32

1 Sundip passes electricity through solutions of some ionic compounds and finds out what products are formed at the positive and negative electrodes.

(a) Here are Sundip's results.

Solution	Product at positive electrode	Product at negative electrode
concentrated sodium chloride	chlorine gas	hydrogen gas
dilute sodium chloride	oxygen gas	hydrogen gas
dilute copper chloride	chlorine gas	copper metal
concentrated copper sulfate	oxygen gas	copper metal
concentrated copper chloride	.....	.....
dilute sodium sulfate	.....	.....

(i) Complete the table by predicting the products formed at each electrode when electricity is passed through concentrated copper chloride and dilute sodium sulfate. **[3]**

(ii) Sundip uses tests to identify the gases formed in her experiments.

Draw lines to connect each **gas** to its correct **test and result**.

Gas	Test and result
	relights a glowing splint
chlorine	makes a lighted splint go 'pop'
oxygen	turns lime water milky
hydrogen	turns blue litmus red and then bleaches it
	turns red litmus blue and then bleaches it

[2]

(iii) Explain why, at the negative electrode:

- **copper** metal is formed when electricity is passed through dilute copper chloride,
  but
- **hydrogen** gas is formed when electricity is passed through dilute sodium chloride.

[2]

(b) This is a list of apparatus Sundip uses to pass electricity through the solution of dilute sodium chloride:

- electrodes
- leads and clips
- a battery
- a beaker
- the solution of sodium chloride.

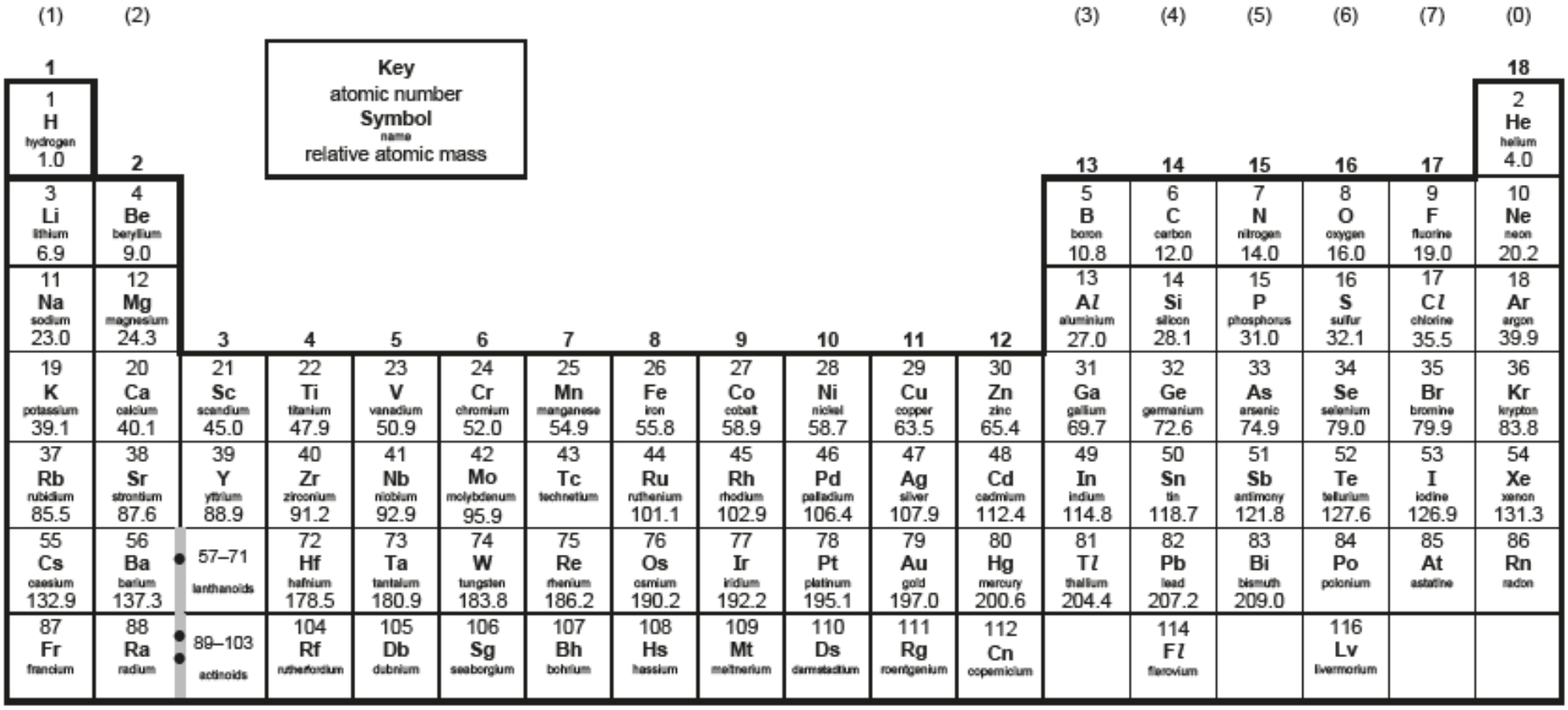
Draw a labelled diagram to show how Sundip sets up her experiment to pass electricity through the solution of dilute sodium chloride.

[2]

Total Marks for Question Set 32: 9

Resource Materials

The Periodic Table of the Elements



(1)	(2)											(3)	(4)	(5)	(6)	(7)	(0)
1																	18
1 H hydrogen 1.0	2											13	14	15	16	17	2 He helium 4.0
3 Li lithium 6.9	4 Be beryllium 9.0											5 B boron 10.8	6 C carbon 12.0	7 N nitrogen 14.0	8 O oxygen 16.0	9 F fluorine 19.0	10 Ne neon 20.2
11 Na sodium 23.0	12 Mg magnesium 24.3	3	4	5	6	7	8	9	10	11	12	13 Al aluminium 27.0	14 Si silicon 28.1	15 P phosphorus 31.0	16 S sulfur 32.1	17 Cl chlorine 35.5	18 Ar argon 39.9
19 K potassium 39.1	20 Ca calcium 40.1	21 Sc scandium 45.0	22 Ti titanium 47.9	23 V vanadium 50.9	24 Cr chromium 52.0	25 Mn manganese 54.9	26 Fe iron 55.8	27 Co cobalt 58.9	28 Ni nickel 58.7	29 Cu copper 63.5	30 Zn zinc 65.4	31 Ga gallium 69.7	32 Ge germanium 72.6	33 As arsenic 74.9	34 Se selenium 79.0	35 Br bromine 79.9	36 Kr krypton 83.8
37 Rb rubidium 85.5	38 Sr strontium 87.6	39 Y yttrium 88.9	40 Zr zirconium 91.2	41 Nb niobium 92.9	42 Mo molybdenum 95.9	43 Tc technetium	44 Ru ruthenium 101.1	45 Rh rhodium 102.9	46 Pd palladium 106.4	47 Ag silver 107.9	48 Cd cadmium 112.4	49 In indium 114.8	50 Sn tin 118.7	51 Sb antimony 121.8	52 Te tellurium 127.6	53 I iodine 126.9	54 Xe xenon 131.3
55 Cs caesium 132.9	56 Ba barium 137.3	57–71 lanthanoids	72 Hf hafnium 178.5	73 Ta tantalum 180.9	74 W tungsten 183.8	75 Re rhenium 186.2	76 Os osmium 190.2	77 Ir iridium 192.2	78 Pt platinum 195.1	79 Au gold 197.0	80 Hg mercury 200.6	81 Tl thallium 204.4	82 Pb lead 207.2	83 Bi bismuth 209.0	84 Po polonium	85 At astatine	86 Rn radon
87 Fr francium	88 Ra radium	89–103 actinoids	104 Rf rutherfordium	105 Db dubnium	106 Sg seaborgium	107 Bh bohrium	108 Hs hassium	109 Mt meitnerium	110 Ds darmstadtium	111 Rg roentgenium	112 Cn copernicium		114 Fl flerovium		116 Lv livermorium		

Key
atomic number
Symbol
name
relative atomic mass