MARK SCHEME

GCSE

CHEMISTRY

Empirical Formulae - 1

1. Find the empirical formula of each of the following substances.

a) Al 20.2%, Cl 79.8%

Al	Cl
20.2/27	79.8/35.5
0.748/0.748	2.25/0.748
1	3

Empirical formula = $AlCl_3$

Answer: $AlCl_3$

b) C 0.60 g, H 0.10 g, O 0.80 g

C	H	O
0.60/12	0.10/1	0.80/16
0.050/0.050	0.100/0.050	0.050/0.050
1	2	1

Empirical formula = CH_2O

Answer: CH_2O

c) Fe 72.4%, O 27.6%

Fe	O
72.4/56	27.6/16
1.29/1.29	1.725/1.29
1	1.34
3	4

Empirical formula = Fe_3O_4

Answer: Fe_3O_4

d) B 0.5156 g, H 0.0844 g

B	H
0.5156/11	0.0844/1
0.0469/0.0469	0.0844/0.0469
1	1.80
5	9

Empirical formula = B_5H_9

Answer: B_5H_9

2. 0.860 g of iron reacts with chlorine form 2.496 g of iron chloride. Find the empirical formula of this iron chloride.

Mass Fe = 0.860 g

Mass Cl = 2.496 – 0.860 = 1.636 g

Fe	Cl
0.860/56	1.636/35.5
0.01536/0.01536	0.04608/0.01536
1	3

Empirical formula = $FeCl_3$

Answer: $FeCl_3$