

SMART EXAM RESOURCES
SUBJECT: CHEMISTRY
TOPIC: STOICHIOMETRY
SET-5-QP-MS

FORMULA OF COMPOUNDS AND IONS

1 Ester **Z** has the empirical formula $\text{C}_3\text{H}_6\text{O}$ and a relative molecular mass of 116.

Calculate the molecular formula of ester **Z**.

has the empirical formula C

molecular formula = [1]

MARK SCHEME:

$\text{C}_6\text{H}_{12}\text{O}_2$	1
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2 Fluorine reacts with sulfur to form a compound which has 25.2% sulfur by mass and a relative molecular mass of 254.

Determine the molecular formula of this compound.

molecular formula = [3]

MARK SCHEME:

Method 1 M1 S $25.2 / 32$ or $0.78 / 0.79 \dots$ and F $74.8 / 19$ or $3.93 / 3.94 \dots$ M2 $\div$ both by $0.7875 = 1 : 5$ or SF_5 M3 ($254 \div 127 = 2$ and) S_2F_{10} Method 2 M1 $254 \times 25.2 / 100$ and $254 \times 74.8 / 100$ OR '64' and '190' M2 $64 / 32$ and $190 / 19$ M3 (2 and 10) to give S_2F_{10}	3
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3 Ester **Z** has the empirical formula $\text{C}_2\text{H}_4\text{O}$ and a relative molecular mass of 88.

Determine the molecular formula of ester **Z**.

molecular formula = [1]

MARK SCHEME:

$C_4H_8O_2$	1
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4 Gallium is in the same group as aluminium and forms similar compounds.

Predict the formulae of:

gallium(III) chloride

gallium(III) sulfate.

[2]

MARK SCHEME:

M1 GaCl_3 (1)	2
M2 $\text{Ga}_2(\text{SO}_4)_3$ (1)	

5

Another ore of iron is iron pyrites, FeS_2 . Iron pyrites contains the positive ion, Fe^{2+} .

Deduce the formula of the negative ion in FeS_2 .

..... [1]

MARK SCHEME:

	S_2^{2-} or S^{2-}	1
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