

## EMPIRICAL FORMULA CALCULATION

Paper: 1C  
Question: 9(a)

### Question

Halon 1301 is a compound used in some fire extinguishers.

Halon 1301 has the percentage composition by mass of

C 8.05%      Br 53.69%      F 38.26%

(a) Show, by calculation, that the empirical formula of this compound is  $\text{CBrF}_3$

(2)

### Mark Scheme

<b>M1</b> C $8.05 \div 12$ <b>OR</b> 0.671 <b>and</b> Br $53.69 \div 80$ <b>OR</b> 0.671 <b>and</b> F $38.26 \div 19$ <b>OR</b> 2.01  <b>M2</b> divide all numbers by 0.671 (to obtain ratio 1 : 1 : 3)	<b>ALLOW</b> ECF from <b>M1</b>  If division by atomic numbers or numerators and denominators reversed 0 marks  <b>Alternative method</b>  <b>M1</b> $M_r$ (of $\text{CBrF}_3$ ) = 149  <b>M2</b> $\frac{12}{149} \times 100 = 8.05$ (%)  <b>and</b> $\frac{80}{149} \times 100 = 53.69$ (%)  <b>and</b> $\frac{58}{149} \times 100 = 38.26$ (%)
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