Balanced Chemical Reaction Review

Unbalanced Reaction

$Na + Cl_2 \longrightarrow NaCl$

Na : 1 Na : 1

Cl : 2 Cl : 1

Balanced Reaction

$2Na + Cl_2 \longrightarrow 2NaCl$

Na : $2 \cdot 1 = 2$ Na : $2 \cdot 1 = 2$

Cl : 2 Cl : $2 \cdot 1 = 2$

$Na + Na + Cl_2 \longrightarrow NaCl + NaCl$

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Molar Ratio in Balanced Equations

Molar Ratio

Each coefficient in a chemical reaction can be read in two ways

① Atomic Ratio (Ind. Atoms)

② Molar Ratio (mol of Atoms)

$2Na + 1Cl_2 \longrightarrow 2NaCl$

Atomic Ratio

2 Na (atoms) + 1 Cl_2 (molecule) forms 2 NaCl (compound)

Molar Ratio

2 mol Na + 1 mol Cl_2 forms 2 mol NaCl

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Counting Atoms in Balanced Equations

$3\,Na_2O + 2\,AlCl_3 \longrightarrow 6\,NaCl + 1\,Al_2O_3$

Na_2O	$AlCl_3$	$NaCl$	Al_2O_3
$Na_2O : 3$	$AlCl_3 : 2$	$NaCl : 6$	$Al_2O_3 : 1$
$Na : 3 \cdot 2 = 6$	$Al : 2 \cdot 1 = 2$	$Na : 6 \cdot 1 = 6$	$Al : 1 \cdot 2 = 2$
$O : 3 \cdot 1 = 3$	$Cl : 2 \cdot 3 = 6$	$Cl : 6 \cdot 1 = 6$	$O : 1 \cdot 3 = 3$

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Counting Atoms in Balanced Equations

$3\,Ca(NO_3)_2 + 2\,Na_3PO_4 \longrightarrow 1\,Ca_3(PO_4)_2 + 6\,NaNO_3$

$Ca(NO_3)_2$	Na_3PO_4	$Ca_3(PO_4)_2$	$NaNO_3$
$Ca(NO_3)_2 : 3$	$Na_3PO_4 : 2$	$Ca_3(PO_4)_2 : 1$	$NaNO_3 : 6$
$Ca : 3 \cdot 1 = 3$	$Na : 2 \cdot 3 = 6$	$Ca : 1 \cdot 3 = 3$	$Na : 6 \cdot 1 = 6$
$N : 3 \cdot 1 \cdot 2 = 6$	$P : 2 \cdot 1 = 2$	$P : 1 \cdot 1 \cdot 2 = 2$	$N : 6 \cdot 1 = 6$
$O : 3 \cdot 3 \cdot 2 = 18$	$O : 2 \cdot 4 = 8$	$O : 1 \cdot 4 \cdot 2 = 8$	$O : 6 \cdot 3 = 18$

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