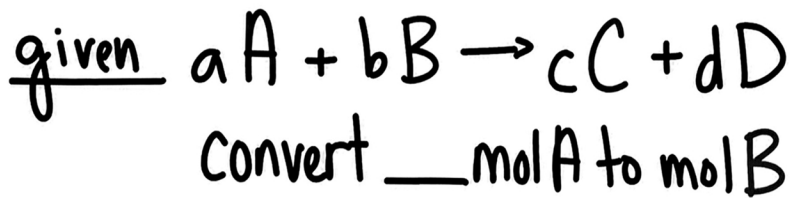


Noteset 6A (Part 3) - In Class Noteset

Single and Double Molar Conversions

Single Molar Conversions



$$\frac{\text{___ mol A}}{a \text{ mol A}} \times \frac{b \text{ mol B}}{b \text{ mol B}} = \text{___ mol B}$$

a, b, etc. : coefficient
bal. eqn.
A, B, etc. element
compound

Mol Ratio

$$a \text{ mol A} = b \text{ mol B}$$

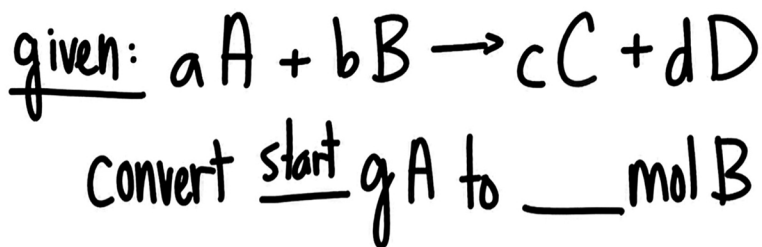
Conversion Factor

$$\frac{b \text{ mol B}}{a \text{ mol A}} = 1$$

The mol ratio converts
between mol A and mol B

Double Molar Conversions

Two single molar conversions
used to convert between two
different units/parts of a reaction.



Two Steps: mass A to mol A and mol A to mol B

Two Step Mass Conversion

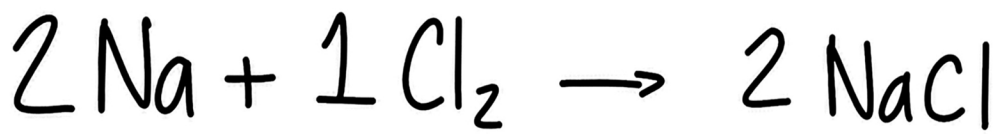
mass A to mol B

- ① mass A to mol A
- ② mol A to mol B

mol A to mass B

- ① mol A to mol B
- ② mol B to mass B

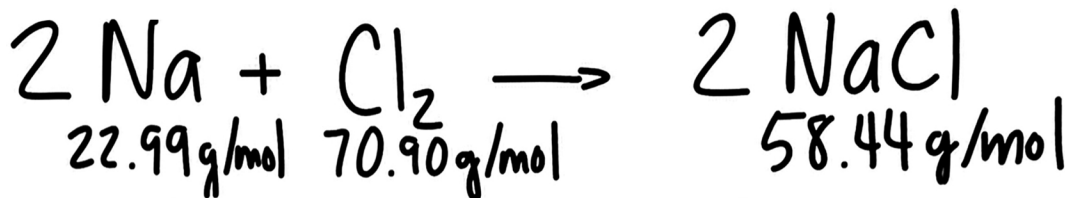
Single Molar Conversion Example



3.0 mol Na, Convert to mol Cl₂ and mol NaCl

$3.0 \text{ mol Na} \rightarrow \text{mol Cl}_2$ $2 \text{ mol Na} = 1 \text{ mol Cl}_2$ <table style="border-collapse: collapse; width: 100%;"> <tr> <td style="border-right: 1px solid black; padding: 5px;">3.0 mol Na</td> <td style="padding: 5px;">1 mol Cl₂</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;"></td> <td style="padding: 5px;">2 mol Na</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">$\frac{3.0 \times 1}{2}$</td> <td style="padding: 5px;">= 1.5 mol Cl₂</td> </tr> </table>	3.0 mol Na	1 mol Cl ₂		2 mol Na	$\frac{3.0 \times 1}{2}$	= 1.5 mol Cl ₂	$3.0 \text{ mol Na} \rightarrow \text{mol NaCl}$ $2 \text{ mol Na} = 2 \text{ mol NaCl}$ <table style="border-collapse: collapse; width: 100%;"> <tr> <td style="border-right: 1px solid black; padding: 5px;">3.0 mol Na</td> <td style="padding: 5px;">2 mol NaCl</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;"></td> <td style="padding: 5px;">2 mol Na</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;">$\frac{3.0 \times 2}{2}$</td> <td style="padding: 5px;">= 3.0 mol NaCl</td> </tr> </table>	3.0 mol Na	2 mol NaCl		2 mol Na	$\frac{3.0 \times 2}{2}$	= 3.0 mol NaCl
3.0 mol Na	1 mol Cl ₂												
	2 mol Na												
$\frac{3.0 \times 1}{2}$	= 1.5 mol Cl ₂												
3.0 mol Na	2 mol NaCl												
	2 mol Na												
$\frac{3.0 \times 2}{2}$	= 3.0 mol NaCl												

Double Molar Conversion Example



Convert 150.0g Cl ₂ to mol NaCl <u>A</u> <u>B</u> ① mass Cl ₂ to mol Cl ₂ ② mol Cl ₂ to mol NaCl	① 150.0g Cl ₂ → mol Cl ₂ <table style="border-collapse: collapse; width: 100%;"> <tr> <td style="border-right: 1px solid black; padding: 5px;">150.0g Cl₂</td> <td style="padding: 5px;">1 mol Cl₂</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;"></td> <td style="padding: 5px;">70.90g Cl₂</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;"></td> <td style="padding: 5px;">= <u>2.12 mol Cl₂</u></td> </tr> </table>	150.0g Cl ₂	1 mol Cl ₂		70.90g Cl ₂		= <u>2.12 mol Cl₂</u>	② mol Cl ₂ → mol NaCl <table style="border-collapse: collapse; width: 100%;"> <tr> <td style="border-right: 1px solid black; padding: 5px;">\downarrow 2.12 mol Cl₂</td> <td style="padding: 5px;">2 mol NaCl</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;"></td> <td style="padding: 5px;">1 mol Cl₂</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;"></td> <td style="padding: 5px;">= <u>4.24 mol NaCl</u></td> </tr> </table>	\downarrow 2.12 mol Cl ₂	2 mol NaCl		1 mol Cl ₂		= <u>4.24 mol NaCl</u>
150.0g Cl ₂	1 mol Cl ₂													
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