## 2 concentration of individurallons

$$
\begin{array}{cccc}
\mathbf{M g B r}_{2(\mathrm{~s})} & \xrightarrow{\mathbf{H}_{2} \mathrm{O}} & \mathbf{M g}^{+2}(\mathrm{aq}) & + \\
1 \mathrm{~mol} & \longrightarrow & & 2 \mathbf{B r}^{-}(\mathrm{aq}) \\
& \longrightarrow & + & \\
& & + & 2 \mathrm{M} \\
0.3 \mathrm{~mol} & \longrightarrow & & +
\end{array}
$$

## 2 concentration of individurallons

| $\mathbf{M g B r} \mathbf{2}_{(s)}$ | $\xrightarrow{\mathrm{H}_{2} \mathrm{O}}$ | $\mathbf{M g}{ }^{\mathbf{+ 2}}$ (aq) | + | $2 \mathrm{Br}^{-}$(aq) |
| :---: | :---: | :---: | :---: | :---: |
| 1 mol |  | 1 mol | + | 2 mol |
|  | $\longrightarrow$ |  | + | 2 M |
| 0.3 mol | $\longrightarrow$ |  | + |  |

# 4. Concentration of individuallons 

| $\mathbf{M g B r}_{2(\mathrm{~s})}$ | $\xrightarrow{\mathbf{H}_{2} \mathrm{O}}$ | $\mathbf{M g}^{+\mathbf{C a q}^{(\mathrm{aq}}}$ | + | $\mathbf{2 B r}^{-}{ }_{(\mathrm{aq})}$ |
| :---: | :---: | :---: | :---: | :---: |
| 1 mol | $\longrightarrow$ | 1 mol | + | 2 mol |
| 1 M | $\longrightarrow$ | 1 M | + | 2 M |
| 0.3 mol | $\longrightarrow$ |  | + |  |

# 2-concentration of Hndividuallons 

| $\mathbf{M g B r}_{2}(\mathrm{~s})$ | $\mathrm{H}_{2} \mathrm{O}$ | $\mathbf{M g}{ }^{\mathbf{+ 2}}{ }_{(a q)}$ | + | $2 \mathrm{Br}^{-}$(aq) |
| :---: | :---: | :---: | :---: | :---: |
| 1 mol |  | 1 mol | + | 2 mol |
| 1 M |  | 1 M | + | 2 M |
| 0.3 mol | - | 0.3 M | + | o. 6 M |

## 2Goncentration of Fividerlons

 Example: What are the concentrations of ions in a $1.5 \mathrm{M} \mathrm{Fe}_{2} \mathrm{O}_{3}$ solution?$$
\begin{aligned}
& \mathrm{Fe}_{2} \mathrm{O}_{3} \rightarrow 2 \mathrm{Fe}^{3+}+3 \mathrm{O}^{2-} \\
& 1.5 \mathrm{M} \quad 3.0 \mathrm{M} \quad 4.5 \mathrm{M}
\end{aligned}
$$

Example: $8.5 \mathrm{~g}^{\mathrm{g}} \mathrm{MgCl}_{2}$ is dissolved in 2.0 L . What is $\left[\mathrm{Mg}^{+2}\right]$ and [C1]?

## Goncentration of lnd viemallons

 Example: What are the concentrations of ions in a $1.5 \mathrm{M} \mathrm{Fe}_{2} \mathrm{O}_{3}$ solution?$$
\begin{gathered}
\mathrm{Fe}_{2} \mathrm{O}_{3} \\
1.5 \mathrm{M}
\end{gathered} \underset{3.0 \mathrm{M}}{2 \mathrm{Fe}^{3+}}+\underset{4.5 \mathrm{M}}{+3 \mathrm{O}^{2-}}
$$

Example: $8.5 \mathrm{~g}^{\mathrm{g}} \mathrm{MgCl}_{2}$ is dissolved in 2.0 L . What is $\left[\mathrm{Mg}^{+2}\right]$ and [C1]?
$\left[\mathrm{MgCl}_{2}\right]=8.5 \mathrm{~g} \times \frac{1 \mathrm{~mol}}{95.1 \mathrm{~g}} \times \frac{1}{2.0} \mathrm{~L}=0.045 \mathrm{M}$

## Goncentration of Madviemalons

 Example: What are the concentrations of ions in a $1.5 \mathrm{M} \mathrm{Fe}_{2} \mathrm{O}_{3}$ solution?$$
\begin{aligned}
& \mathrm{Fe}_{2} \mathrm{O}_{3} \rightarrow 2 \mathrm{Fe}^{3+}+3 \mathrm{O}^{2-} \\
& 1.5 \mathrm{M} \quad 3.0 \mathrm{M} \quad 4.5 \mathrm{M}
\end{aligned}
$$

Example: $8.5 \mathrm{~g}^{\mathrm{g}} \mathrm{MgCl}_{2}$ is dissolved in 2.0 L . What is $\left[\mathrm{Mg}^{+2}\right]$ and [C1]?
$\left[\mathrm{MgCl}_{2}\right]=8.5 \mathrm{~g} \times \underline{1 \mathrm{~mol}} \times \underset{2}{1}=0.045 \mathrm{M}$

$$
95.1 \mathrm{~g} \quad 2.0 \mathrm{~L}
$$

$\mathrm{MgCl}_{2} \rightarrow \mathrm{Mg}^{+2}+2 \mathrm{Cl}^{-}$

## Goncentration or marvielal ons

 Example: What are the concentrations of ions in a $1.5 \mathrm{M} \mathrm{Fe}_{2} \mathrm{O}_{3}$ solution?$$
\begin{aligned}
& \mathrm{Fe}_{2} \mathrm{O}_{3} \rightarrow \underset{2 \mathrm{Fe}^{3+}}{ }+3{ }_{3}{ }_{3}^{2-} \\
& 1.5 \mathrm{M}
\end{aligned} \underset{4.5 \mathrm{M}}{ }
$$

Example: 8.5 g of $\mathrm{MgCl}_{2}$ is dissolved in 2.0 L . What is $\left[\mathrm{Mg}^{+2}\right]$ and [Cl-]?
$\left[\mathrm{MgCl}_{2}\right]=8.5 \mathrm{~g} \times \underline{1 \mathrm{~mol}} \times \underline{\underline{1}}=0.045 \mathrm{M}$
$95.1 \mathrm{~g} \quad 2.0 \mathrm{~L}$
$\mathrm{MgCl}_{2} \rightarrow \mathrm{Mg}^{+2}+2 \mathrm{Cl}^{-}$
$0.045 \mathrm{M} \quad \mathbf{0 . 0 4 5} \mathrm{M} \quad \mathbf{0 . 0 9 0 M}$

## 2concentration of ridividurallons

 Example: 500 mL of $\mathrm{o} .8 \mathrm{M} \mathrm{Li}_{2} \mathrm{CO}_{3}$ is mixed with 500 mL of 0.5 $\mathrm{M} \mathrm{BeF}_{2}$. Find concentration of all ions!
## 2concentration of ridividurallons

 Example: 500 mL of $\mathrm{o} .8 \mathrm{M} \mathrm{Li}_{2} \mathrm{CO}_{3}$ is mixed with 500 mL of 0.5 $\mathrm{M} \mathrm{BeF}{ }_{2}$. Find concentration of all ions!$\mathrm{Li}_{2} \mathrm{CO}_{3}$
$\longrightarrow$
$2 \mathrm{Li}^{+}+\mathrm{CO}_{3}^{-2}$

## 2concentration of ridividurallons

 Example: 500 mL of $\mathrm{o} .8 \mathrm{M} \mathrm{Li}_{2} \mathrm{CO}_{3}$ is mixed with 500 mL of 0.5 $\mathrm{M} \mathrm{BeF}_{2}$. Find concentration of all ions!$\mathrm{Li}_{2} \mathrm{CO}_{3}$
$\longrightarrow$
$2 \mathrm{Li}^{+}+$
$\mathrm{CO}_{3}{ }^{-2}$
o.8oM
0.40 M
$C_{1} V_{1}=C_{2} V_{2}$

## 4-concentrationofnaiviomallons

 Example: 500 mL of $\mathrm{o} .8 \mathrm{M} \mathrm{Li}_{2} \mathrm{CO}_{3}$ is mixed with 500 mL of 0.5 $\mathrm{M} \mathrm{BeF}_{2}$. Find concentration of all ions!$\mathrm{Li}_{2} \mathrm{CO}_{3}$
$\longrightarrow$
$2 \mathrm{Li}^{+}+$
$\mathrm{CO}_{3}^{-2}$
o.80M
0.40 M
$C_{1} V_{1}=C_{2} V_{2}$
$(0.8)(0.5)=\left(C_{2}\right)(1.0)$

## 4- Goncentration or harvienal ons

 Example: 500 mL of $\mathrm{o} .8 \mathrm{M} \mathrm{Li}_{2} \mathrm{CO}_{3}$ is mixed with 500 mL of 0.5 $\mathrm{M} \mathrm{BeF}{ }_{2}$. Find concentration of all ions!$\mathrm{Li}_{2} \mathrm{CO}_{3}$

$2 \mathrm{Li}^{+}+$
$\mathrm{CO}_{3}{ }^{-2}$
o.4M
o.8M
o.4M

$$
\begin{aligned}
& C_{1} V_{1}=C_{2} V_{2} \\
& (0.8)(0.5)=\left(C_{2}\right)(1.0) \\
& C_{2}=\mathbf{0 . 4} \mathbf{M}
\end{aligned}
$$

Or: o. $8 \mathrm{M} \mathrm{Li}_{2} \mathrm{CO}_{3} \times 500 \mathrm{ml} / 1000 \mathrm{ml}=\mathbf{o} .4 \mathbf{M ~ L i}_{2} \mathrm{CO}_{3}$

## concentration oflnaividuallons

 Example: 500 mL of $\mathrm{o} .8 \mathrm{M} \mathrm{Li}_{2} \mathrm{CO}_{3}$ is mixed with 500 mL of 0.5 $\mathrm{M} \mathrm{BeF}_{2}$. Find concentration of all ions!$\mathrm{Li}_{2} \mathrm{CO}_{3}$
$\longrightarrow$
$2 \mathrm{Li}^{+}+\mathrm{CO}_{3}^{-2}$
$0.8 \mathrm{M} \quad 0.4 \mathrm{M}$

$$
\begin{aligned}
& C_{1} V_{1}=C_{2} V_{2} \\
& (0.8)(0.5)=\left(C_{2}\right)(1.0) \\
& C_{2}=\mathbf{0 . 4} \mathbf{M}
\end{aligned}
$$

Or: o. $8 \mathrm{M} \mathrm{Li}_{2} \mathrm{CO}_{3} \times 500 \mathrm{ml} / 1000 \mathrm{ml}=\mathbf{o} .4 \mathbf{M ~ L i}_{2} \mathrm{CO}_{3}$
$\mathrm{BeF}_{2} \quad \rightarrow \quad \mathrm{Be}^{2+}+2 \mathrm{~F}^{-}$

## Goncentration of Fndividerallons

 Example: 500 mL of $\mathrm{o} .8 \mathrm{M} \mathrm{Li}_{2} \mathrm{CO}_{3}$ is mixed with 500 mL of 0.5 $\mathrm{M} \mathrm{BeF}_{2}$. Find concentration of all ions!
o. $5 \mathrm{MBeF}_{2} \times 500 \mathrm{ml} / 1000 \mathrm{ml}=0.25 \mathrm{MBeF}_{2}$

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