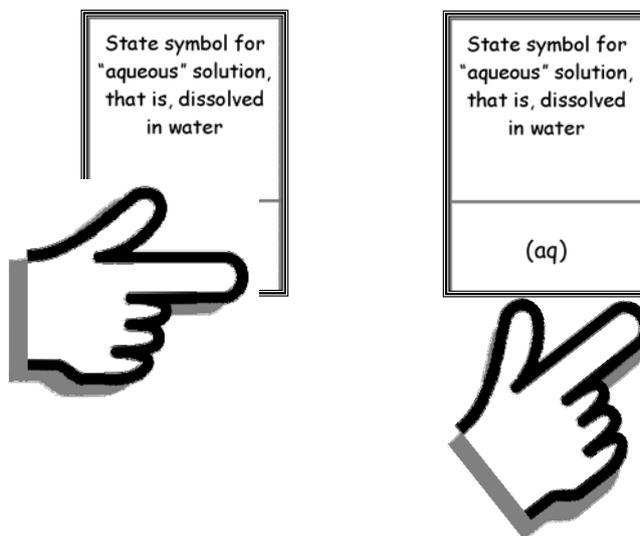


Chemistry AS90171

Describe chemical reactions

This achievement standard involves the description of chemical reactions, including the carrying out of calculations.

Print and cut out the cards. Test yourself (cover the answer with your finger) and then reveal the answer to check if you were correct.



There are cards for:

- precipitation reactions
- thermal decomposition reactions
- oxidation-reduction reactions
- calculations

These cards can be use on their own or as a test of your understanding of the revision notes for this topic.

A blank set of cards is also included for your own use.

Insoluble solid formed when 2 solutions are mixed and an insoluble product is made	State symbol for "aqueous" solution, that is, dissolved in water	$A + B \rightarrow C + D$ The "starting chemicals" are called the...	$A + B \rightarrow C + D$ The chemicals C and D are called the...
precipitate	(aq)	reactants	products
$\text{Cu}^{2+}(\text{aq}) + 2\text{OH}^{-}(\text{aq}) \rightarrow \text{Cu}(\text{OH})_2(\text{s})$ is an example of what kind of equation?	What are the ions called that are "left out" of ionic equations?	What does the state symbol (aq) stand for?	What are (s), (aq) and (g) (written after formulae) called?
ionic equation (precipitation)	spectator ions	aqueous (dissolved in water)	state symbols
A substance that does not dissolve in water is known as	A substance that does dissolve in water is known as	What colour is a precipitate of copper(II) hydroxide? $\text{Cu}(\text{OH})_2(\text{s})$	What colour is a precipitate of iron(II) hydroxide? $\text{Fe}(\text{OH})_2(\text{s})$
insoluble	soluble	blue	green
What colour is a precipitate of iron(III) hydroxide? $\text{Fe}(\text{OH})_3(\text{s})$	What does (s) mean in this equation? $\text{Cu}^{2+}(\text{aq}) + 2\text{OH}^{-}(\text{aq}) \rightarrow \text{Cu}(\text{OH})_2(\text{s})$	To work out if something is soluble or insoluble, use the....	What colour is a precipitate of copper(II) carbonate? $\text{CuCO}_3(\text{s})$
brown	solid / precipitate	solubility rules	blue-green

<p>What would be made if these were mixed?</p> <p>copper chloride + silver nitrate</p>	<p>What would be made if these were mixed?</p> <p>zinc sulfate + sodium carbonate</p>	<p>sodium hydroxide + _____</p> <p>→</p> <p>sodium sulfate + zinc hydroxide</p>	<p>Ions: Al^{3+} and OH^-</p> <p>The formula for aluminium hydroxide is:</p>
<p>copper nitrate + silver chloride</p>	<p>zinc carbonate + sodium sulfate</p>	<p>zinc sulfate</p>	<p>$\text{Al}(\text{OH})_3$</p>
<p>Is this precipitation?</p> <p>$\text{CuCl}_2(\text{aq}) + \text{Zn}(\text{s}) \rightarrow \text{Cu}(\text{s}) + \text{ZnCl}_2(\text{aq})$</p>	<p>Precipitation reaction?</p> <p>$\text{CuCl}_2(\text{aq}) + \text{Zn}(\text{NO}_3)_2(\text{aq}) \rightarrow \text{Cu}(\text{NO}_3)_2(\text{aq}) + \text{ZnCl}_2(\text{aq})$</p>	<p>Ions: Zn^{2+} and CO_3^{2-}</p> <p>The formula for zinc carbonate is:</p>	<p>Ions: Pb^{2+} and Cl^-</p> <p>The formula for lead chloride is:</p>
<p>no</p>	<p>no (both products soluble)</p>	<p>ZnCO_3</p>	<p>PbCl_2</p>
<p>Name a blue hydroxide precipitate</p>	<p>Name the green hydroxide precipitate, iron(II) or iron(III) ...</p>	<p>Name this ion:</p> <p>NO_3^-</p>	<p>Name this ion</p> <p>Cl^-</p>
<p>copper hydroxide</p>	<p>iron(II) hydroxide</p>	<p>nitrate</p>	<p>chloride</p>
<p>Name this ion</p> <p>SO_4^{2-}</p>	<p>Name this ion</p> <p>OH^-</p>	<p>Name this ion</p> <p>CO_3^{2-}</p>	<p>Name this compound</p> <p>BaSO_4</p>
<p>sulfate</p>	<p>hydroxide</p>	<p>carbonate</p>	<p>barium sulfate</p>

<p>12</p> <p>Mg</p> <p>24.3</p> <p>The atomic mass of Mg is...</p>	<p>12</p> <p>Mg</p> <p>24.3</p> <p>The atomic number of Mg is...</p>	<table border="1"> <tr> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>C</td> <td>N</td> <td>O</td> </tr> <tr> <td>12.0</td> <td>14.0</td> <td>16.0</td> </tr> <tr> <td>14</td> <td>15</td> <td>16</td> </tr> <tr> <td>Si</td> <td>P</td> <td>S</td> </tr> <tr> <td>28.1</td> <td>31.0</td> <td>32.1</td> </tr> </table> <p>What is mass of 1 mol of CO₂?</p>	6	7	8	C	N	O	12.0	14.0	16.0	14	15	16	Si	P	S	28.1	31.0	32.1	<table border="1"> <tr> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>C</td> <td>N</td> <td>O</td> </tr> <tr> <td>12.0</td> <td>14.0</td> <td>16.0</td> </tr> <tr> <td>14</td> <td>15</td> <td>16</td> </tr> <tr> <td>Si</td> <td>P</td> <td>S</td> </tr> <tr> <td>28.1</td> <td>31.0</td> <td>32.1</td> </tr> </table> <p>What is mass of 2 mol of SO₃?</p>	6	7	8	C	N	O	12.0	14.0	16.0	14	15	16	Si	P	S	28.1	31.0	32.1
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24.3	12	12.0 + (2 × 16.0) = 44 g	2 × (32.1+(3×16.0)) = 160.2 g																																				
What is an empirical formula?	What does a molecular formula represent, eg C ₃ H ₈ ?	What is the empirical formula of C ₄ H ₈ ?	What is the empirical formula of C ₄ H ₁₀ ?																																				
simplest whole number ratio of atoms	the actual number of atoms	CH ₂	C ₂ H ₅																																				
How do you calculate the mass of 1 mole (mol) of a substance?	n = m/M m = mass & M = mass of 1 mol What is n?	If something has a ratio of atoms 1 X : 2½ Y what is the empirical formula?	What colour change would you see when copper carbonate is heated?																																				
it's the sum of the atomic mass(es) in g	n is the amount, in mol	X ₂ Y ₅	green to black																																				
What type of reaction is this? Metal hydroxide → metal oxide + water	What type of reaction is this? Metal carbonate → metal oxide + carbon dioxide	What type of reaction is this? Metal hydrogen carbonate → metal oxide + water + carbon dioxide	What reagent (chemical) turns milky when CO ₂ is bubbled through it?																																				
thermal decomposition	thermal decomposition	thermal decomposition	lime water (calcium hydroxide)																																				

Apart from the chemical, what else is needed in a thermal decomposition reaction?	$\text{Cu(OH)}_2(\text{s}) \rightarrow \text{CuO}(\text{s}) + \text{H}_2\text{O}(\text{l})$ What colour changes would you see?	Are thermal decomposition reactions reversible?	$\text{ZnCO}_3(\text{s}) \rightarrow \text{ZnO}(\text{s}) + \text{CO}_2(\text{g})$ What colour change would you see?
heat	blue to black	no	white to white! (but yellow when hot)
$\text{CaCO}_3(\text{s}) \rightarrow \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$ What colour change would you see?	What is the test for carbon dioxide gas?	Carbon dioxide can be collected by "downward delivery" because....	_____ (s) \rightarrow $\text{Na}_2\text{CO}_3(\text{s}) + \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{l})$ What is this?
none (white reactant and product)	turns lime water cloudy/milky	it is denser than air	$\text{NaHCO}_3(\text{s})$
What is an alternative name for sodium bicarbonate, $\text{NaHCO}_3(\text{s})$	Which decomposes more easily CuCO_3 or CaCO_3 ?	Why is heat needed to bring about thermal decomposition reactions?	Name the reaction where a single compound breaks into 2 or 3 simpler compounds
sodium hydrogen carbonate	CuCO_3 (carbonate of unreactive metal)	to break bonds	thermal decomposition
Metal hydroxide $\xrightarrow{\text{heat}}$	Metal carbonate $\xrightarrow{\text{heat}}$	Metal hydrogen carbonate $\xrightarrow{\text{heat}}$	What potential danger must you avoid when heating with a delivery tube into water?
metal oxide + water	metal oxide + carbon dioxide	metal oxide + carbon dioxide + water	suck back

Oxidation is the addition of oxygen/hydrogen (choose)	Oxidation is the removal of oxygen/hydrogen (choose)	Another name for an oxidising agent is	Another name for an reducing agent is
oxygen	hydrogen	oxidant	reductant
$\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$ The CuO is _____ to Cu	$\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$ The oxidant in this equation is	$2\text{PbO} + \text{C} \rightarrow 2\text{Pb} + \text{CO}_2$ The oxidant in this equation is	$2\text{PbO} + \text{C} \rightarrow 2\text{Pb} + \text{CO}_2$ The reducing agent is
reduced	CuO	PbO	C
In a reaction, an oxidising agent is the substance that becomes (oxidised/reduced)	In terms of electron loss or gain, oxidation is the _____ of electrons	In terms of electron loss or gain, reduction is the _____ of electrons	LEO the  says
reduced	loss	gain	GER!!!
$\text{Mg} \rightarrow \text{Mg}^{2+} + 2\text{e}^-$ The Mg has lost/gained e^- and so has been oxidised/reduced	$\text{Cu}^{2+} + 2\text{e}^- \rightarrow \text{Cu}$ The Cu has lost/gained e^- and so has been oxidised/reduced	$\text{Mg} + \text{CuSO}_4 \rightarrow \text{MgSO}_4 + \text{Cu}$ What would happen the colour of the solution?	$\text{Mg} + \text{CuSO}_4 \rightarrow \text{MgSO}_4 + \text{Cu}$ What colour is copper?
lost, oxidised	gained, reduced	blue fades to colourless	pinky orange metal

<p>Balance this</p> $\text{Cu} + \text{Ag}^+ \rightarrow \text{Cu}^{2+} + \text{Ag}$	<p>What would happen to the colour of the solution? (silver nitrate is colourless)</p> $\text{Cu} + \text{Ag}^+ \rightarrow \text{Cu}^{2+} + \text{Ag}$	 <p>What is OIL RIG in terms of electrons?</p>	<p>What are the 2 ions in $\text{ZnSO}_4(\text{aq})$?</p>
$\text{Cu} + 2\text{Ag}^+ \rightarrow \text{Cu}^{2+} + 2\text{Ag}$	<p>turn blue</p>	<p>oxidation is loss, reduction is gain</p>	$\text{Zn}^{2+}(\text{aq}) \text{ and } \text{SO}_4^{2-}(\text{aq})$
<p>What colour is chlorine gas, $\text{Cl}_2(\text{g})$ OR chlorine solution, $\text{Cl}_2(\text{aq})$?</p>	<p>Is chlorine a good oxidising agent or a good reducing agent?</p>	$2\text{I}^-(\text{aq}) \rightarrow \text{I}_2(\text{aq}) + 2\text{e}^-$ <p>What would the colour change be?</p>	<p>Describe how Mg ribbon burns in air and what is produced.</p>
<p>pale yellow</p>	<p>oxidising agent</p>	<p>colourless to brown</p>	<p>bright white light, ash of MgO</p>
$\text{Zn} + \text{CuSO}_4 \rightarrow \text{ZnSO}_4 + \text{Cu}$ <p>Add the state symbols to the equation</p>	$\text{Cu} + \text{Ag}^+ \rightarrow \text{Cu}^{2+} + \text{Ag}$ <p>is an example of a h _ _ _ equation</p>	<p>What ion is responsible for this (blue) colour?</p> 	<p>When combining 2 redox half equations, what must the electrons do?</p>
$\text{Zn}(\text{s}) + \text{CuSO}_4(\text{aq}) \rightarrow \text{ZnSO}_4(\text{aq}) + \text{Cu}(\text{s})$	<p>half</p>	<p>copper(II) / $\text{Cu}^{2+}(\text{aq})$</p>	<p>cancel out</p>
<p>What could you mix to make this silver tree in a blue solution?</p> 	<p>Redox is short for</p>	<p>Can oxidation occur without reduction occurring (or vice versa)?</p>	<p>Why does a piece of copper wire dipped in silver nitrate solution soon look furry?</p>
<p>copper "tree" suspended in silver nitrate solution</p>	<p>reduction and oxidation</p>	<p>no!</p>	<p>crystals of silver form on it</p>

