

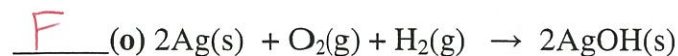
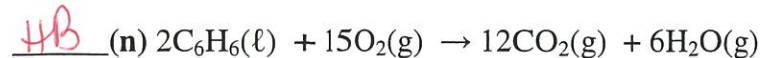
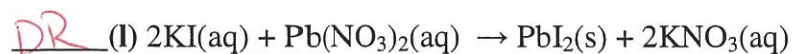
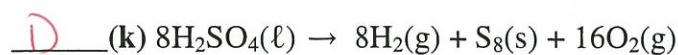
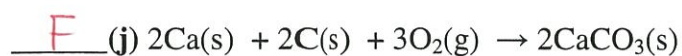
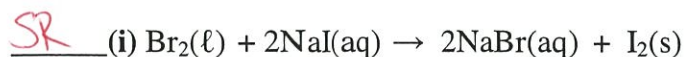
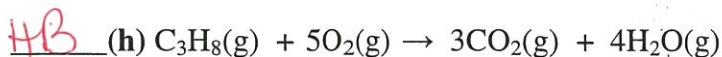
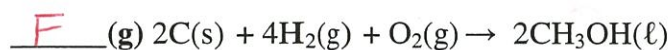
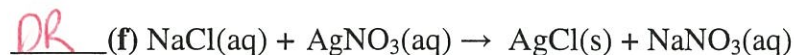
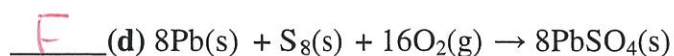
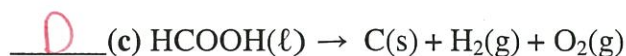
Chemistry 20

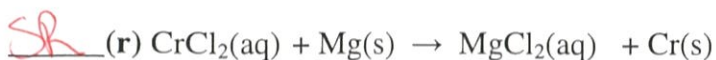
Quantitative Relationships in Chemical Changes

Net Ionic Equations

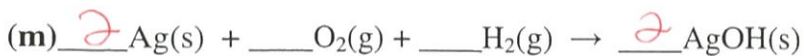
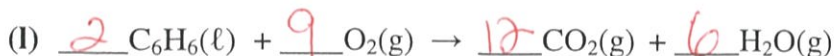
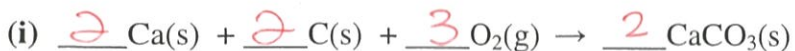
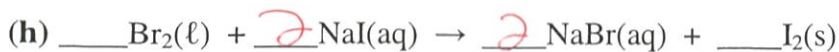
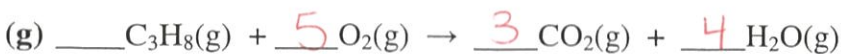
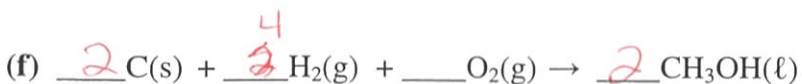
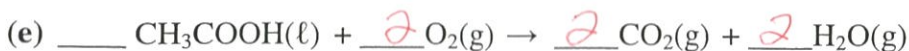
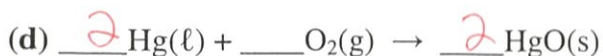
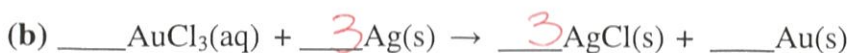
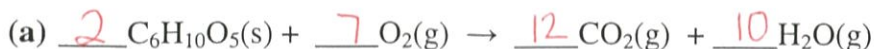
Review:

1. Classify each of these reactions into one of the following reaction types: formation (F), single replacement (SR), decomposition (D), hydrocarbon burning (HB), double replacement (DR), or combustion (C).





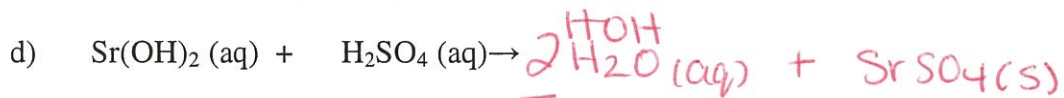
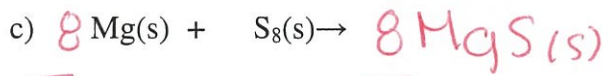
2. Balance the following chemical reactions.



24
10
34
16
14

12
6
18

3. Predict the product for the following incomplete chemical equations. Then balance the equations.

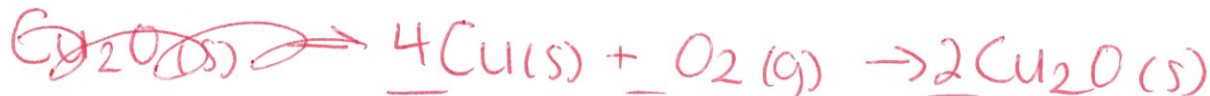


4. Write the balanced equations for the following chemical reactions:

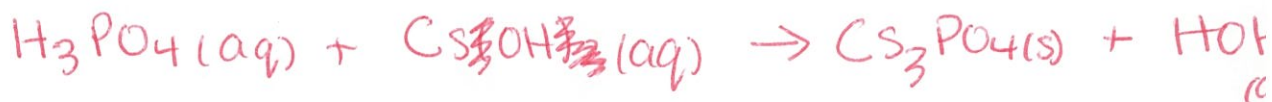
a) Cyclopentane, $\text{C}_5\text{H}_{10}(\text{l})$, reacts with oxygen to produce carbon dioxide and water vapour.



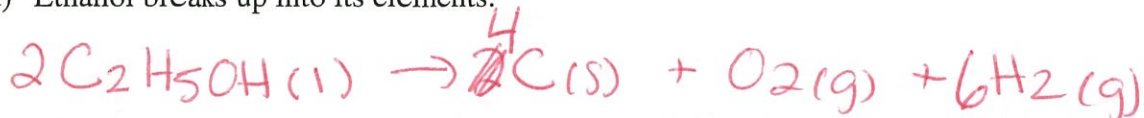
b) Copper(I) oxide forms from its elements.



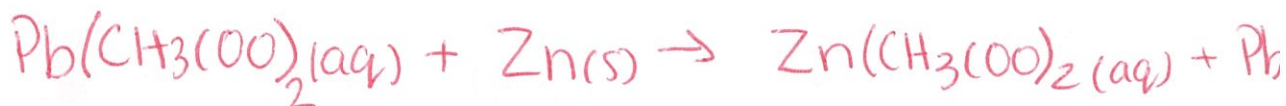
c) Phosphoric acid is neutralized by cesium hydroxide solution to produce cesium phosphate solution and liquid water.



d) Ethanol breaks up into its elements.



e) Lead(II) acetate reacts with zinc metal to form zinc acetate solution and solid lead.



Writing Net Ionic Equations:

- 1) Write a complete balanced chemical equation
- 2) Dissociate all high-solubility ionic compounds, and ionize all strong acids to show the complete ionic equation
- 3) Cancel identical entities that appear on both the reactant and product sides (Spectator ions)
- 4) Write the net ionic equation, reducing coefficients if necessary

Examples:

1. Write the net ionic equation for the reaction of aqueous barium chloride and aqueous sodium sulfate. (Refer to the solubility table)

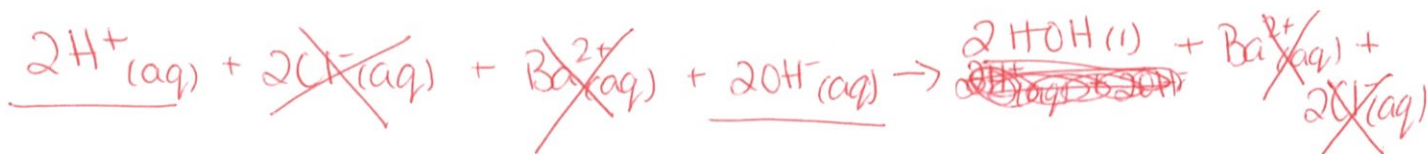


Ions that are present but do not take part in (change during) a reaction are called spectator ions (like spectators at a sports game: they are present but do not take part in the game)

2. Write the net ionic equation for the reaction of zinc metal and aqueous copper (II) sulfate (Refer to the solubility table)

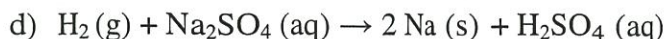
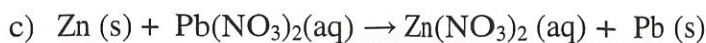
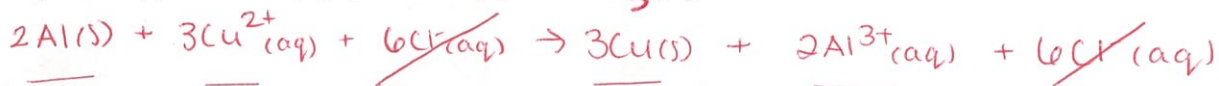
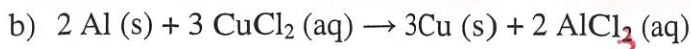
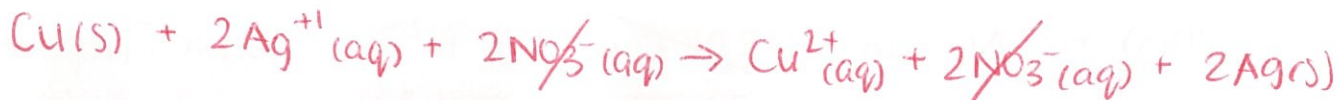
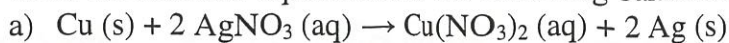


3. Write the net ionic equation for the reaction of hydrochloric acid and barium hydroxide

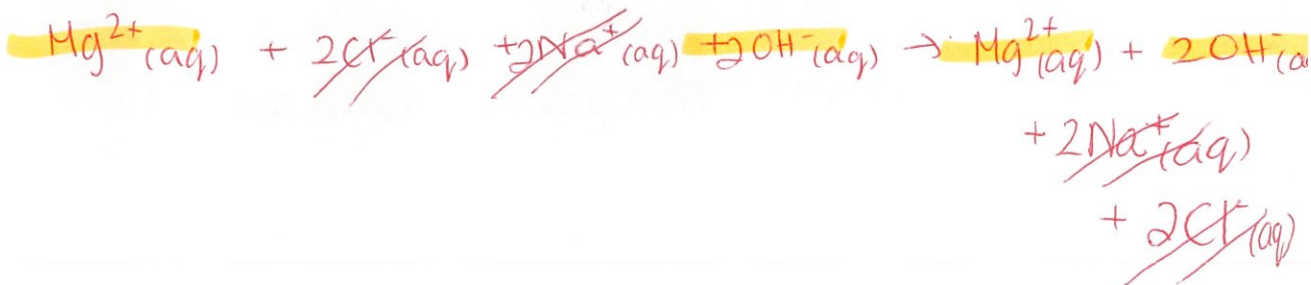
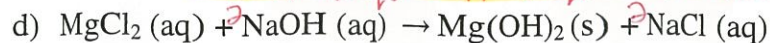
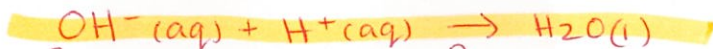
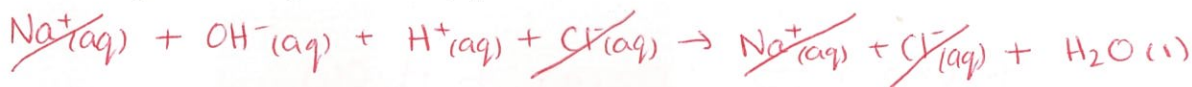
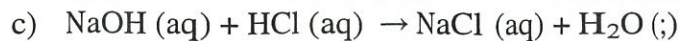
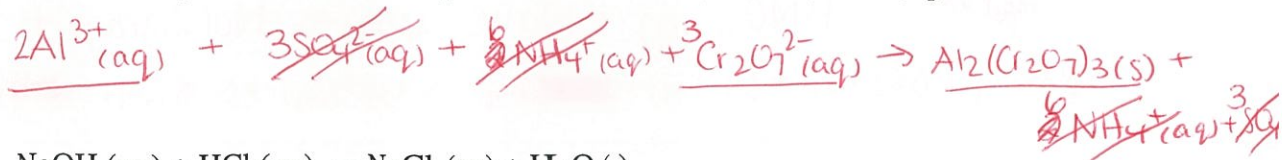
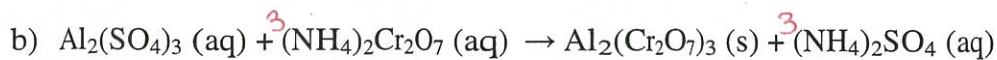
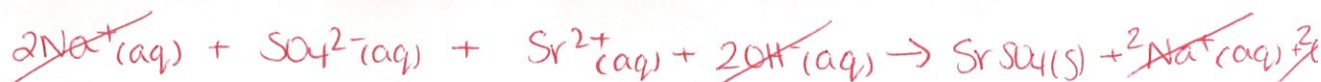
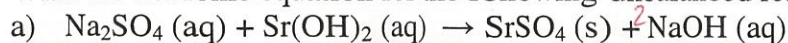


Practice:

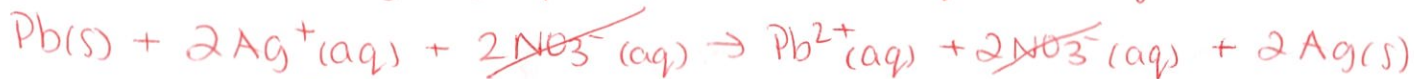
1. Write the net ionic equations for the following balanced reaction:



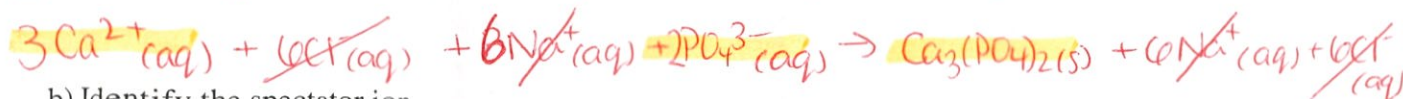
2. Write the net ionic equation for the following unbalanced reaction.



3. In a laboratory test of the metal activity series, a student places a strip of lead metal into aqueous silver nitrate. Write the net ionic equation for the reaction that occurs.



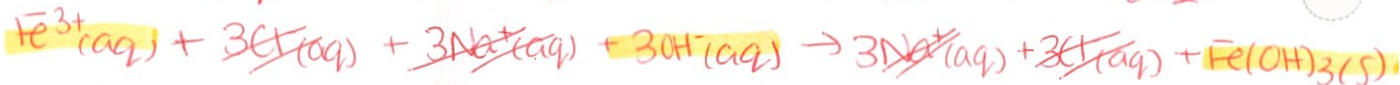
4. a) In a water treatment facility, sodium phosphate is added to remove calcium ions from water. Write the net ionic equation for the reaction of aqueous calcium chloride and aqueous sodium phosphate.



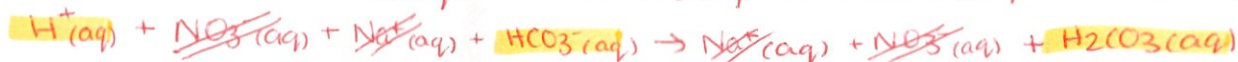
- b) Identify the spectator ion.



5. Some natural waters contain iron ions that affect the taste of the water and cause rust stains. Aeration converts any iron (II) ions into iron (III) ions. A basic solution (containing hydroxide ions) is added to produce a precipitate. Write the net ionic equations for the reaction of aqueous iron (III) ions and aqueous hydroxide ions.



6. A nitric acid spill is quickly neutralized by pouring a sodium hydrogen carbonate (baking soda) solution on it.) Write the chemical equation and the net ionic equation for this neutralization reaction. Identify the spectator ions by name.



7. When you open a can of pop, the pressure inside the can is released. This allows the aqueous carbonic acid to decompose, forming carbon dioxide gas and water.

- a) Write the net ionic equation for this reaction



- b) Write a statement about the dual role of water molecules in this particular reaction.

Water is both a product and a solvent.