Chapter 2ish

| Chemistry 20 | Science 10 Review |
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| Lesson 5+6:Formation, decomposition and combustion Equations | 84 mins |

Law of Conservation of Mass

- Matter **CANNOT** be created or destroyed
- Matter CAN (and will) transform

Formation Reactions

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| - ELEMENTS become 1 COMPOUND<br>- Reactants ⟶ Products<br>- MUST be balanced (WHOLE number only)<br>- Remember your binary elements and others...(by themselves... not in compounds)<br>- $N_2$ $O_2$ $F_2$ $Cl_2$ $Br_2$ $I_2$ $At_2$<br>- $P_4$ $S_8$ and $O_3$ (ozone)<br>- If using a transition metal and the charge is NOT given then you use the most common charge. Ie... the first.<br><br>PRACTICE:<br>1a-d 2a-e | $A + B \longrightarrow AB$<br><br>Ex.<br>Solid calcium combines with solid Iodine to become solid calcium iodide.<br><br>Word equation<br>Calcium + Iodine ⟶ Calcium Iodide<br><br>Reaction Formula<br>$Ca_{(s)} + I_{2(s)} \longrightarrow CaI_{2(s)}$<br><br>Example<br>Word equation<br>Scandium + sulphur ⟶ scandium sulphide<br>Formula<br>$(16)Sc_{(s)} + (3)S_{8(s)} \longrightarrow (8)Sc_2S_{3(s)}$<br><br>$(6)Sr_{(s)} + P_{4(s)} \longrightarrow (2)Sr_3P_{2(s)}$<br><br>$Ti_{(s)} + (2)Br_{2(l)} \longrightarrow TiBr_{4(s)}$ |

Simple Decomposition

| | |
|---|---|
| - 1 compound becomes elements<br>  - Opposite of formation<br>- | $AB \longrightarrow A + B$<br><br>$(8)V_2S_{5(s)} \longrightarrow (16)V_{(s)} + (5)S_{8(s)}$<br><br>$(4)(NH_4)_3PO_{4(aq)} \longrightarrow (6)N_{2(g)} + (24)H_{2(g)} + P_{4(s)} + (8)O_{2(g)}$<br>$Sc_2(OOCCOO)_{3(s)} \longrightarrow (2)Sc_{(s)} + (6)O_{2(g)} + (6)C_{(s)}$ |

Complete Combustion (Burning)

| | |
|---|---|
| - The burning of a fuel<br>- ALWAYS uses oxygen ($O_{2(g)}$)<br>- TIP: Balance Oxygen LAST<br>- Hydrocarbons become $CO_{2(g)}$ and $H_2O_{(g)}$<br>- Other elements in combustion<br>  - $C \rightarrow CO_{2(g)}$<br>  - $H \rightarrow H_2O_{(g)}$<br>  - $S \rightarrow SO_{2(g)}$<br>  - $N \rightarrow NO_{2(g)}$ | Basic form (hydrocarbons)<br>$C_xH_{y(g)} + O_{2(g)} \rightarrow CO_{2(g)} + H_2O_{(g)}$<br><br>Examples<br>$C_3H_{8(g)} + (5)O_{2(g)} \rightarrow (3)CO_{2(g)} + (4)H_2O_{(g)}$<br><br>$C_{12}H_{22}O_{11(s)} + (12)O_{2(g)} \rightarrow (12)CO_{2(g)} + (11)H_2O_{(g)}$<br><br>$S_{8(s)} + (8)O_{2(g)} \rightarrow (8)SO_{2(g)}$<br><br>$(2)CH_3SCH_{3(g)} + (9)O_{2(g)} \rightarrow CO_{2(g)} + H_2O_{(g)} + SO_{2(g)}$<br>(methyl sulfide) |

Practice FINISH

# Chemistry 20 - Science 10 Review - Formation, Decomposition, and Complete Combustion

Name: _____

Ensure that your chemical equations are balanced. Ensure that your symbolic equations are properly *balanced* using coefficients.

1. Complete each of the following word equations. You may need to look up some chemical formulas using your textbook.
    a. sodium plus fluorine gas produces _____
    b. barium plus selenium produces _____
    c. calcium plus iodine produces _____
    d. strontium plus nitrogen produces _____
    e. hydrogen fluoride decomposes to _____
    f. magnesium phosphate decomposes to _____
    g. iron (III) hydroxide decomposes to _____
    h. vanadium (V) sulfide decomposes to _____
    i. methane burned in oxygen produces _____
    j. glucose burned in oxygen produces _____
    k. propane burned in oxygen produces _____
    l. nitrogen monoxide burned in oxygen produces _____

2. Write balanced symbolic chemical equations for each of the following reactions. Use the most common charge for ambiguous multivalent ions.
    a. sodium mixed with fluorine gas.

    _____

    b. arium mixed with selenium.

    _____

    c. calcium mixed with iodine.

    _____

    d. strontium mixed with nitrogen.

    _____

    e. vanadium mixed with astatine.

    _____

f. the decomposition of hydrogen fluoride.

_____

g. the decomposition of magnesium phosphate.

_____

h. the decomposition of iron (III) hydroxide.

_____

i. the decomposition of vanadium (V) sulfide.

_____

j. the complete combustion of methane.

_____

k. the complete combustion of glucose.

_____

l. the complete combustion of propane.

_____

m. the complete combustion of sucrose.

_____

n. the complete combustion of nitrogen.

_____

o. the complete combustion of carbon disulfide.

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