Name - _____

- 1.) Translate the following word equations into chemical symbols and balance the resulting equations. Do not include the phases.
 - a.) potassium and water yield potassium hydroxide and hydrogen gas.

 $2 \text{ K} + 2 \text{ H}_2\text{O} \rightarrow 2 \text{ KOH} + \text{H}_2$

b.) strontium and water makes strontium hydroxide and hydrogen gas.

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Sr + 2H_2O \rightarrow Sr(OH)_2 + H_2
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c.) aluminum metal and chlorine gas are mixed to make aluminum chloride.

 $2 \text{ Al} + 3 \text{ Cl}_2 \rightarrow 2 \text{ AlCl}_3$

d.) copper (I) oxide and carbon are reacted to form copper metal and carbon dioxide gas.

 $2 Cu_2O + C \rightarrow 4 Cu + CO_2$

e.) ammonia and sulphuric acid combine to form ammonium sulphate.

 $2 \text{ NH}_3 + \text{H}_2 \text{SO}_4 \rightarrow (\text{NH}_4)_2 \text{SO}_4$

2.) In each of the following reactions write a balanced chemical equation, including the phases.

a.) Liquid phosphoric acid reacts with aqueous barium hydroxide to give water and a precipitate of barium phosphate.

 $2 H_3PO_4 (I) + 3 Ba(OH)_2 (aq) \rightarrow Ba_3(PO_4)_2 (s) + 6 H_2O (I)$

b.) Solid aluminum oxide and aqueous sulphuric acid produce water and aqueous aluminum sulphate.

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AI_2O_3 (s) + 3 H_2SO_4 (aq) \rightarrow AI_2(SO_4)_3 (aq) + 3 H_2O (l)
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c.) Nitrogen trifluoride gas and hydrogen gas react to form nitrogen gas and gaseous hydrogen fluoride.

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2 NF_{3(q)} + 3 H_{2(q)} \rightarrow N_{2(q)} + 6 HF_{(q)}
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d.) Powdered sodium carbonate and aqueous hydrobromic acid react to form carbon dioxide gas, aqueous sodium bromide and water.

 $Na_2CO_3 (s)$ + 2 HBr (aq) \rightarrow 2 NaBr (aq) + $CO_2 (q)$ + $H_2O (l)$

e.) sodium nitrate crystals and solid sodium metal react to form solid sodium oxide and nitrogen gas.

2 NaNO_{3 (s)} + 10 Na (s) \rightarrow 6 Na₂O (s) + N_{2 (q)}

f.) Gaseous boron trichloride reacts with steam to yield solid boron trihydroxide and hydrogen chloride gas.

 $BCI_{3 (q)} + 3 H_2O_{(q)} \rightarrow B(OH)_{3 (s)} + 3 HCI_{(q)}$

g.) Gaseous xenon hexafluoride reacts violently with water to form solid xenon trioxide and gaseous hydrogen fluoride.

 $XeF_{6 (q)} + 3 H_2O_{(l)} \rightarrow XeO_{3 (s)} + 6 HF_{(q)}$