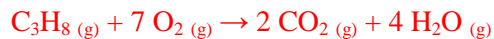


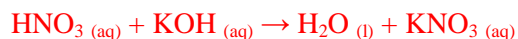
## Writing Chemicals Equations

1. Use your knowledge of chemistry to use the reactants listed below to write complete BALANCED chemical equations.

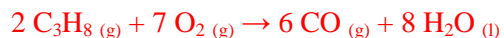
a. The complete combustion of propane ( $\text{C}_3\text{H}_8$ ).



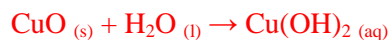
b. The reaction of nitric acid and potassium hydroxide.



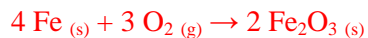
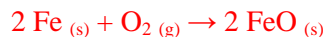
c. The incomplete combustion of propane to form carbon monoxide and water.



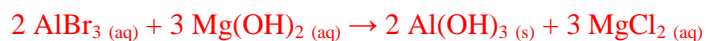
d. The reaction of copper (II) oxide with water.



e. The reaction of iron with oxygen.



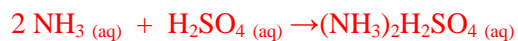
f. The reaction of aluminum bromide with magnesium hydroxide.



g. The decomposition of hydrogen peroxide ( $\text{H}_2\text{O}_2$ )



h. The reaction of ammonia with sulfuric acid (one product).



2. Predict the products of the following reactions and classify each of the reactions as synthesis, decomposition, combustion, single displacement, double displacement (neutralization, precipitation, production of gas). For each reaction provide ALL of the states. If there is no net reaction, write no reaction.

- a.  $\text{Ag} + \text{CuSO}_4 \rightarrow \text{no reaction}$
- b.  $2 \text{NaI} + \text{CaCl}_2 \rightarrow \text{CaI}_2 (\text{aq}) + 2 \text{NaCl} (\text{aq}) \rightarrow \text{no reaction}$
- c.  $\text{O}_2 (\text{g}) + 2 \text{H}_2 (\text{g}) \rightarrow \text{H}_2\text{O} (\text{g})$
- d.  $2 \text{HNO}_3 (\text{aq}) + \text{Mn}(\text{OH})_2 (\text{aq}) \rightarrow 2 \text{H}_2\text{O} (\text{l}) + \text{Mn}(\text{NO}_3)_2 (\text{aq})$
- e.  $3 \text{Na} (\text{s}) + \text{FeBr}_3 (\text{aq}) \rightarrow 2 \text{NaBr} (\text{aq}) + \text{Fe} (\text{s})$
- f.  $\text{NaC}_2\text{H}_3\text{O}_2 (\text{aq}) + \text{AgNO}_3 (\text{aq}) \rightarrow \text{AgC}_2\text{H}_3\text{O}_2 (\text{s}) + \text{NaNO}_3 (\text{aq})$
- g.  $2 \text{AgNO}_3 (\text{aq}) + \text{BaSO}_4 (\text{s}) \rightarrow \text{Ag}_2\text{SO}_4 (\text{s}) + \text{Na}(\text{NO}_3)_2 (\text{aq})$
- h.  $\text{AgNO}_3 (\text{aq}) + \text{NaC}_2\text{H}_3\text{O}_2 (\text{aq}) \rightarrow \text{NaNO}_3 (\text{aq}) + \text{AgC}_2\text{H}_3\text{O}_2 (\text{s})$
- i.  $\text{HCN} + \text{CuSO}_4 \rightarrow$
- j.  $2 \text{H}_2\text{O}_2 \rightarrow 2 \text{H}_2\text{O} (\text{l}) + \text{O}_2 (\text{g})$
- k.  $2 \text{Na}_2\text{O} (\text{s}) \rightarrow 4 \text{Na} (\text{s}) + \text{O}_2 (\text{g})$
- l.  $\text{Zn} (\text{aq}) + \text{Au}(\text{NO}_2)_2 (\text{aq}) \rightarrow \text{Zn}(\text{NO}_3)_2 (\text{aq}) + \text{Au} (\text{s})$
- m.  $\text{C}_4\text{H}_8 (\text{g}) + \text{H}_2 \rightarrow \text{C}_4\text{H}_{10} (\text{l})$
- n.  $\text{H}_2\text{O} (\text{l}) + \text{Ag} (\text{s}) \rightarrow \text{no reaction}$
- o.  $2 \text{NaC}_2\text{H}_3\text{O}_2 (\text{aq}) + \text{H}_2\text{SO}_4 (\text{aq}) \rightarrow \text{Na}_2\text{SO}_4 (\text{aq}) + 2 \text{HC}_2\text{H}_3\text{O}_2 (\text{aq}) \rightarrow \text{no net rxn}$
- p.  $\text{Zn} + \text{H}_2\text{CO}_3 \rightarrow \text{ZnCO}_3 (\text{aq}) + \text{H}_2 (\text{g})$
- q.  $\text{C}_2\text{H}_4\text{O}_2 (\text{s}) + 3 \text{O}_2 (\text{g}) \rightarrow 2 \text{CO}_2 (\text{g}) + 4 \text{H}_2\text{O} (\text{l})$
- r.  $\text{PbSO}_4 (\text{s}) + 2 \text{AgNO}_3 (\text{aq}) \rightarrow \text{Ag}_2\text{SO}_4 (\text{s}) + \text{Pb}(\text{NO}_3)_2 (\text{aq})$
- s.  $6 \text{HBr} (\text{aq}) + 2 \text{Fe} (\text{s}) \rightarrow 3 \text{H}_2 (\text{g}) + 2 \text{FeBr}_3 (\text{aq})$   
 $2 \text{HBr} (\text{aq}) + \text{Fe} (\text{s}) \rightarrow \text{FeBr}_2 (\text{aq}) + \text{H}_2 (\text{g})$
- t.  $2 \text{LiBr} (\text{aq}) + \text{Co}(\text{SO}_3)_2 (\text{aq}) \rightarrow \text{Li}_2\text{SO}_4 (\text{aq}) + \text{CoBr}_2 (\text{s})$
- u.  $\text{LiNO}_3 + \text{Ag} \rightarrow \text{no reaction}$
- v.  $4 \text{PBr}_3 (\text{s}) \rightarrow \text{P}_4 (\text{s}) + 6 \text{Br}_2 (\text{g})$
- w.  $\text{NH}_3 (\text{aq}) + \text{H}_2\text{O} (\text{l}) \rightarrow \text{NH}_4\text{OH} (\text{aq})$
- x.  $\text{N}_2 (\text{g}) + 2 \text{O}_2 (\text{g}) \rightarrow 2 \text{NO}_2 (\text{g})$
- y.  $\text{H}_2\text{CO}_3 \rightarrow \text{H}_2\text{O} (\text{l}) + \text{CO}_2 (\text{g})$
- z.  $2 \text{KOH} (\text{aq}) + \text{H}_2\text{SO}_4 (\text{aq}) \rightarrow 2 \text{H}_2\text{O} (\text{l}) + \text{K}_2\text{SO}_4 (\text{aq})$
- aa.  $\text{Pb}(\text{NO}_3)_2 (\text{aq}) + \text{K}_2\text{CrO}_4 (\text{aq}) \rightarrow 2 \text{KNO}_3 (\text{aq}) + \text{PbCrO}_4 (\text{s})$
- bb.  $\text{PtCl}_4 (\text{aq}) + \text{Cl}_2 (\text{aq}) \rightarrow \text{PtCl}_6 (\text{aq})$
- cc.  $2 \text{KMnO}_4 (\text{aq}) + \text{ZnCl}_2 (\text{aq}) \rightarrow 2 \text{KCl} (\text{aq}) + \text{Zn}(\text{MnO}_4)_2 (\text{s})$
- dd.  $2 \text{KCl} (\text{aq}) + \text{Mg}(\text{OH})_2 (\text{aq}) \rightarrow 2 \text{H}_2\text{O} (\text{l}) + \text{MgCl}_2 (\text{aq})$
- ee.  $4 \text{C}_2\text{H}_3\text{O}_2 (\text{s}) + 7 \text{O}_2 (\text{g}) \rightarrow 8 \text{CO}_2 (\text{g}) + 6 \text{H}_2\text{O} (\text{l})$
- ff.  $2 \text{H}_2\text{O}_2 (\text{l}) \rightarrow 2 \text{H}_2 (\text{g}) + \text{O}_2 (\text{g})$
- gg.  $\text{Ca}(\text{OH})_2 (\text{aq}) + 2 \text{HF} (\text{aq}) \rightarrow 2 \text{H}_2\text{O} (\text{l}) + \text{CaF}_2 (\text{aq})$