

## Classifying Chemical Reactions Worksheet

1. Classify each reaction as synthesis (S), decomposition (D), single displacement (SD), double displacement (DD) or combustion (C).
2. The equations are not balanced – SO BE SURE TO BALANCE THEM, TOO!!!
3. If single displacement, check the activity series to be sure that a reaction actually does occur. If not, then write NR for no reaction.
4. If double displacement, use the solubility rules to predict the phase of the products. Write the phase of each product in parentheses after the formula.

1.  $\underline{\quad} \text{PbCl}_2(\text{aq}) + \underline{2} \text{AgNO}_3(\text{aq}) \rightarrow \underline{\quad} \text{Pb}(\text{NO}_3)_2(\text{aq}) + \underline{2} \text{AgCl}(\text{s})$  D.D. (ppt)
2.  $\underline{\quad} \text{NH}_3(\text{g}) + \underline{\quad} \text{HCl}(\text{aq}) \rightarrow \underline{\quad} \text{NH}_4\text{Cl}(\text{aq})$  S.
3.  $\underline{2} \text{AlCl}_3(\text{aq}) + \underline{3} \text{Na}_2\text{SO}_4(\text{aq}) \rightarrow \underline{\quad} \text{Al}_2(\text{SO}_4)_3(\text{aq}) + \underline{6} \text{NaCl}(\text{aq})$  D.D. (N.R.)  
Both aq!
4.  $\underline{\quad} \text{Zn}(\text{s}) + \underline{\quad} \text{S}(\text{s}) \rightarrow \underline{\quad} \text{ZnS}(\text{s})$  S.
5.  $\underline{\quad} \text{Al}_2(\text{SO}_4)_3(\text{aq}) + \underline{3} \text{BaCl}_2(\text{aq}) \rightarrow \underline{3} \text{BaSO}_4(\text{s}) + \underline{2} \text{AlCl}_3(\text{aq})$  D.D. (ppt)
6.  $\underline{\quad} \text{Al}_2\text{S}_3(\text{s}) \rightarrow \underline{2} \text{Al}(\text{s}) + \underline{3} \text{S}(\text{s})$  D.
7.  $\underline{\quad} \text{H}_2\text{SO}_4(\text{aq}) + \underline{\quad} \text{Fe}(\text{s}) \rightarrow \underline{\quad} \text{H}_2(\text{g}) + \underline{\quad} \text{FeSO}_4(\text{aq})$  S.R.
8.  $\underline{\quad} \text{C}_{12}\text{H}_{22}\text{O}_{11}(\text{s}) + \underline{12} \text{O}_2(\text{g}) \rightarrow \underline{12} \text{CO}_2(\text{g}) + \underline{11} \text{H}_2\text{O}(\text{g})$  C.
9.  $\underline{\quad} \text{Mg}(\text{OH})_2(\text{s}) + \underline{\quad} \text{H}_2\text{SO}_4(\text{aq}) \rightarrow \underline{\quad} \text{MgSO}_4(\text{aq}) + \underline{2} \text{H}_2\text{O}(\text{l})$  D.D. (neut)  
B A Salt water
10.  $\underline{2} \text{NaOH}(\text{aq}) + \underline{\quad} \text{CuSO}_4(\text{aq}) \rightarrow \underline{\quad} \text{Na}_2\text{SO}_4(\text{aq}) + \underline{\quad} \text{Cu}(\text{OH})_2(\text{s})$  D.D. (ppt)
11.  $\underline{\quad} \text{C}_4\text{H}_{12}(\text{g}) + \underline{7} \text{O}_2(\text{g}) \rightarrow \underline{6} \text{H}_2\text{O}(\text{g}) + \underline{4} \text{CO}_2(\text{g})$  C.
12.  $\underline{4} \text{Fe}(\text{s}) + \underline{3} \text{O}_2(\text{g}) \rightarrow \underline{2} \text{Fe}_2\text{O}_3(\text{s})$  S.
13.  $\underline{\quad} \text{MgCl}_2(\text{aq}) + \underline{\quad} \text{H}_2(\text{g}) \nrightarrow \underline{\quad} \text{Mg}(\text{s}) + \underline{2} \text{HCl}(\text{aq})$  S.D. (N.R.)
14.  $\underline{\quad} \text{NH}_4\text{NO}_3(\text{aq}) \rightarrow \underline{\quad} \text{N}_2\text{O}(\text{g}) + \underline{2} \text{H}_2\text{O}(\text{l})$  D.
15.  $\underline{\quad} \text{Cl}_2(\text{g}) + \underline{2} \text{KBr}(\text{s}) \rightarrow \underline{2} \text{KCl}(\text{s}) + \underline{\quad} \text{Br}_2(\text{g})?$  S.D.
16.  $\underline{\quad} \text{HCl}(\text{aq}) + \underline{3} \text{NaOH}(\text{aq}) \rightarrow \underline{\quad} \text{NaCl}(\text{aq}) + \underline{\quad} \text{H}_2\text{O}(\text{l})$  D.D. (neut)  
A B S W
17.  $\underline{\quad} \text{Cu}(\text{s}) + \underline{2} \text{AgNO}_3(\text{aq}) \rightarrow \underline{\quad} \text{Ag}(\text{s}) + \underline{\quad} \text{Cu}(\text{NO}_3)_2(\text{aq})$  S.D.
18.  $\underline{\quad} \text{CaCO}_3(\text{s}) \rightarrow \underline{\quad} \text{CaO}(\text{s}) + \underline{\quad} \text{CO}_2(\text{g})$  D.
19.  $\underline{\quad} \text{N}_2(\text{g}) + \underline{3} \text{H}_2(\text{g}) \rightarrow \underline{2} \text{NH}_3(\text{g})$  S.
20.  $\underline{\quad} \text{Mg}(\text{ClO}_3)_2(\text{s}) \rightarrow \underline{\quad} \text{MgCl}_2(\text{s}) + \underline{3} \text{O}_2(\text{g})$  D.