

CHAPTER 7	Predicting and Balancing Formation, Decomposition, and Hydrocarbon Combustion Reactions	BLM 7.0.5
ASSESSMENT		

Keeping in mind the reminders about states listed below, write balanced equations for the following chemical reactions.

- Acids are always soluble and their states are always (aq).
- Ionic substances are always solid when pure. When exposed to water in a reaction, they will dissolve if the solubility table indicates that they will, with an (aq) notation. If the solubility table indicates that they won't dissolve, then they remain solid (s).
- Some molecular compounds are so common that you already know their states. The others you will need to look up. The appendix table for Standard Molar Enthalpies of Formation gives the states of some molecular compounds.

1. Ethylene (ethene),  $\text{C}_2\text{H}_2(\text{g})$ , forms from its elements.
2. Dihydrogen dioxide (hydrogen peroxide),  $\text{H}_2\text{O}_2(\ell)$ , decomposes into its elements.
3. Methanal,  $\text{CH}_2\text{O}(\ell)$ , burns in oxygen gas.
4. Lead(IV) oxide,  $\text{PbO}_2(\text{s})$ , decomposes into its elements.
5. Cyclohexane,  $\text{C}_6\text{H}_{12}(\ell)$ , undergoes combustion.
6. Iron(II,III) oxide (magnetite),  $\text{Fe}_3\text{O}_4(\text{s})$ , forms from its elements.
7. Benzene,  $\text{C}_6\text{H}_6(\ell)$ , combusts.
8.  $\text{SO}_3(\text{g}) \rightarrow$
9.  $\text{P}_2\text{O}_5(\text{s}) + \text{H}_2\text{O}(\ell) \rightarrow \text{H}_3\text{PO}_4(\text{aq})$
10.  $\text{HgS}(\text{s}) \rightarrow$
11.  $\text{C}_7\text{H}_8(\ell) + \text{O}_2(\text{g}) \rightarrow$
12.  $\text{C}_2\text{H}_5\text{OH}(\ell) + \text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\ell)$