

# Non Sibi High School

## Andover's Chem 550/580: Advanced Chemistry

### Chapter 10, Review Quiz 1 Answers

#### 1

Write a balanced equation for the combustion of each compound below using the smallest possible whole-number coefficients:

- a. butane
- b. pentanol
- c.  $\text{C}_6\text{H}_5\text{SH}$

- a.  $2\text{C}_4\text{H}_{10} + 13\text{O}_2 \longrightarrow 8\text{CO}_2 + 10\text{H}_2\text{O}$
- b.  $2\text{C}_5\text{H}_{11}\text{OH} + 15\text{O}_2 \longrightarrow 10\text{CO}_2 + 12\text{H}_2\text{O}$
- c.  $2\text{C}_6\text{H}_5\text{SH} + 17\text{O}_2 \longrightarrow 12\text{CO}_2 + 6\text{H}_2\text{O} + 2\text{SO}_2$

#### 2

Write a balanced equation for each reaction described below using the smallest possible whole-number coefficients:

- a. lithium oxide reacts with water
- b. potassium carbonate decomposes upon heating
- c. aluminum metal reacts with chlorine gas
- d. cesium metal reacts with water

- a.  $\text{Li}_2\text{O} + \text{H}_2\text{O} \longrightarrow 2\text{Li}^+ + 2\text{OH}^-$
- b.  $\text{K}_2\text{CO}_3 \longrightarrow \text{K}_2\text{O} + \text{CO}_2$
- c.  $2\text{Al} + 3\text{Cl}_2 \longrightarrow 2\text{AlCl}_3$
- d.  $2\text{Cs} + 2\text{H}_2\text{O} \longrightarrow 2\text{Cs}^+ + 2\text{OH}^- + \text{H}_2$

#### 3

What is the molarity of each ion in the following solutions?

- a. 0.032 M  $\text{CrCl}_3$

- b. 0.12 M  $(\text{NH}_4)_2\text{SO}_4$
- a. 0.032 M  $\text{Cr}^{3+}$  and 0.096 M  $\text{Cl}^-$   
 b. 0.24 M  $\text{NH}_4^+$  and 0.12 M  $\text{SO}_4^{2-}$

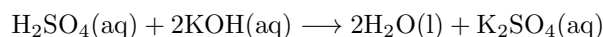
#### 4

Indicate if any of the combinations below yield no reaction and also write a balanced net ionic equation, including states of matter, for any combinations that do yield a precipitate:

- a.  $\text{Cu}(\text{NO}_3)_2(\text{aq}) + \text{K}_3\text{PO}_4(\text{aq})$   
 b.  $\text{Pb}(\text{CH}_3\text{COO})_2(\text{aq}) + \text{NaCl}(\text{aq})$   
 c. aqueous lithium chloride + aqueous ammonium bromide  
 d. aqueous iron(III) nitrate + aqueous potassium chromate
- a.  $3\text{Cu}^{2+}(\text{aq}) + 2\text{PO}_4^{3-}(\text{aq}) \longrightarrow \text{Cu}_3(\text{PO}_4)_2(\text{s})$   
 b.  $\text{Pb}^{2+}(\text{aq}) + 2\text{Cl}^-(\text{aq}) \longrightarrow \text{PbCl}_2(\text{s})$   
 c. no reaction  
 d. a.  $2\text{Fe}^{3+}(\text{aq}) + 3\text{CrO}_4^{2-}(\text{aq}) \longrightarrow \text{Fe}_2(\text{CrO}_4)_3(\text{s})$

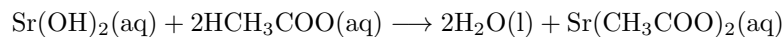
#### 5

Write a balanced molecular equation, including states of matter, for the reaction between solutions of sulfuric acid and potassium hydroxide.



#### 6

How many milliliters of 0.117 M strontium hydroxide are required to titrate 32.5 mL of 0.146 M acetic acid?



$$0.0325 \text{ L} \left( \frac{0.146 \text{ mol HCH}_3\text{COO}}{1 \text{ L}} \right) \left( \frac{1 \text{ mol Sr}(\text{OH})_2}{2 \text{ mol HCH}_3\text{COO}} \right) \left( \frac{1 \text{ L}}{0.117 \text{ mol HCH}_3\text{COO}} \right) \left( \frac{1000 \text{ mL}}{1 \text{ L}} \right) = 20.3 \text{ mL}$$



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