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## Chemistry

## Homework: Reactions

1. What is the difference between  $\text{NaOH(s)}$  and  $\text{NaOH(aq)}$ ?
2.  $\text{CaCl}_2$  is an example of (justify in the box provided):
  - a. a phase
  - b. a compound
  - c. an element
  - d. a metal
3. Baking soda is a white powder used for baking or cleaning. When you mix baking soda,  $\text{NaHCO}_3$ , with vinegar,  $\text{C}_2\text{H}_4\text{O}_2$ , you get a clear colorless liquid and bubbles of  $\text{CO}_2$ .
  - a. Draw the reaction. Label where each compound is located ( $\text{NaHCO}_3$ ,  $\text{C}_2\text{H}_4\text{O}_2$ ,  $\text{CO}_2$ ). Specify the phase of each of the compounds named in the problem.
  - b. Is this a chemical or physical change? Justify your answer using evidence in the description above.
  - c. Where is the sodium, Na, before the change? After the change? How do you know?
  - d. The reaction for this is as follows. Balance it.  
$$\text{___ NaHCO}_3(\text{s}) + \text{___ C}_2\text{H}_4\text{O}_2(\text{aq}) \rightarrow \text{___ NaC}_2\text{H}_3\text{O}_2(\text{aq}) + \text{___ H}_2\text{O}(\text{l}) + \text{___ CO}_2(\text{g})$$
4. What is the law of conservation of mass?
5. An iron nail that stays in contact with water and air starts to form a reddish-brown coating called rust.

Name: \_\_\_\_\_ Period: \_\_\_\_\_

a. Is this a physical or chemical change? Why?

b. Is rust an element, a compound, or a mixture? Explain your thinking.

c. How could you gather more evidence to support your answer in part b?

6. Balance the following reactions and determine reaction type. SHOW all work.

a.  $\text{___ Na}_3\text{PO}_4 + \text{___ KOH} \rightarrow \text{___ NaOH} + \text{___ K}_3\text{PO}_4$  Type: \_\_\_\_\_

b.  $\text{___ MgF}_2 + \text{___ Li}_2\text{CO}_3 \rightarrow \text{___ MgCO}_3 + \text{___ LiF}$  Type: \_\_\_\_\_

c.  $\text{___ P}_4 + \text{___ O}_2 \rightarrow \text{___ P}_2\text{O}_3$  Type: \_\_\_\_\_

d.  $\text{___ AgNO}_3 + \text{___ Cu} \rightarrow \text{___ Cu(NO}_3)_2 + \text{___ Ag}$  Type: \_\_\_\_\_

e.  $\text{___ GaF}_3 + \text{___ Cs} \rightarrow \text{___ CsF} + \text{___ Ga}$  Type: \_\_\_\_\_