

Name: \_\_\_\_\_ Date: \_\_\_\_\_

KEY

**Multiple Choice: Place the CAPITAL letter on the space provided (26 points):**

A 1. Which of the following equations is an example of a single-replacement reaction?

- A.  $\text{Fe} + 2\text{HCl} \rightarrow \text{FeCl}_2 + \text{H}_2$                       B.  $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$   
C.  $2\text{H}_2\text{O}_2 \rightarrow 2\text{H}_2\text{O} + \text{O}_2$                       D.  $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$

B 2. How can the rate of a chemical reaction be increased?

- A. by decreasing the concentration of reactants                      B. by grinding a solid substance into a powder  
C. by lowering the temperature of the reactants                      D. by raising the temperature of the products

C 3. How many atoms are represented by the formula  $\text{CaCO}_3$ ?

- A. three                      B. four                      C. five                      D. six

D 4. If a chemical symbol in a chemical formula has no subscript, it means

- A. the chemical symbol is written incorrectly  
B. the element has no charge  
C. the chemical is listed last in the formula  
D. only one atom of the element is in the molecule

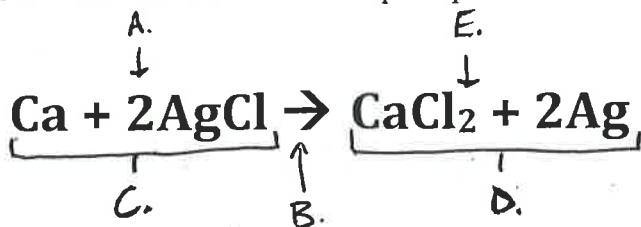
A 5. Why does the law of conservation of mass dictate that chemical equations be balanced?

- A. because atoms are never gained or lost in a chemical reaction  
B. because elements are classified by weight  
C. because chemical formulas are written from left to right  
D. because using the wrong chemical symbol causes confusion

A 6. In which kind of chemical reaction do two or more substances combine to form one new compound?

- A. synthesis                      B. decomposition                      C. single-replacement                      D. double-replacement

Match the labels to the equation. Write the letters in the space provided.



- B 7. Yields sign                      E 8. Subscript                      D 9. Product                      A 10. Coefficient                      C 11. Reactants

A 8. The smallest amount of energy needed to start a chemical reaction is the

- A. activation energy                      B. transition state                      C. inhibitor                      D. catalyst

\_\_\_9. Using the activity series shown below, predict whether or not the following reaction will occur:

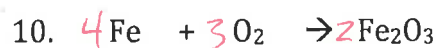
K	Potassium	↑ Most reactive	
Na	Sodium		
Ca	Calcium		
Mg	Magnesium		
Al	Aluminium		
C	Carbon		
Zn	Zinc		
Fe	Iron		
Sn	Tin		
Pb	Lead		
H	Hydrogen		
Cu	Copper		↓ Least reactive
Ag	Silver		
Au	Gold		
Pt	Platinum		
C H added for comparison			
Reactivity Series of Metals			



- A. yes, this reaction will occur.  
B. There is not enough information to answer this question.  
C. No, this reaction will not occur.

*Calcium is more reactive than silver!!*

Balance the following equations and identify the reaction type using "S" for synthesis, "D" for decomposition, "SR" for single replacement, "DR" for double replacement. (18 points):



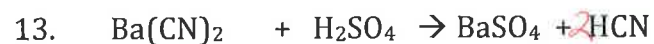
Rxn type: S



Rxn type: DR



Rxn type: SR



Rxn type: DR

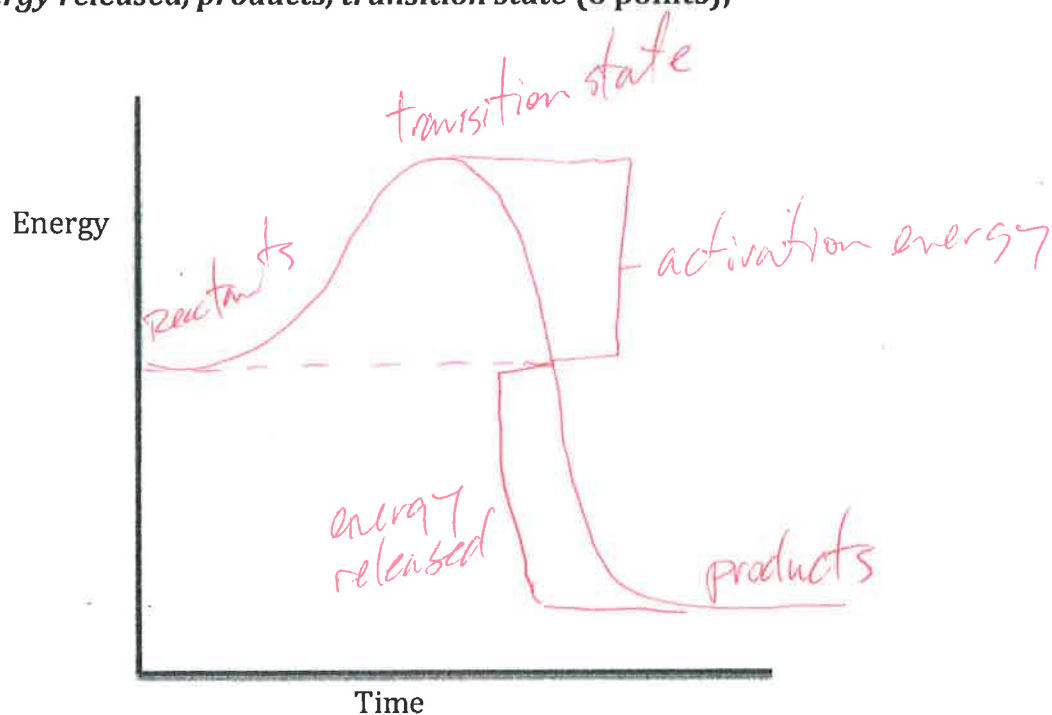


Rxn type: SR

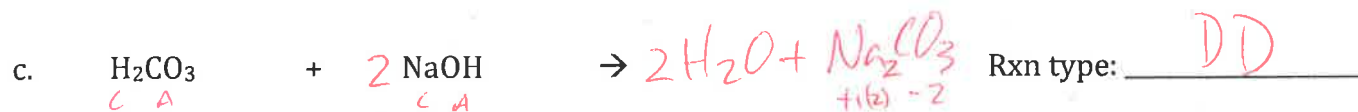
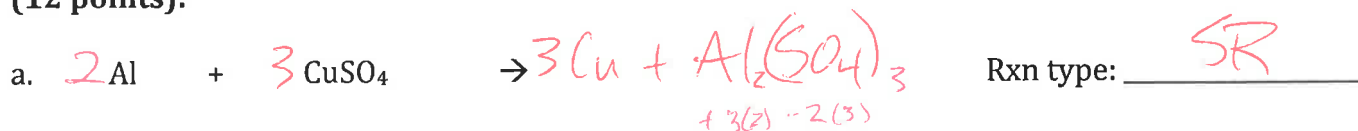


Rxn type: DR

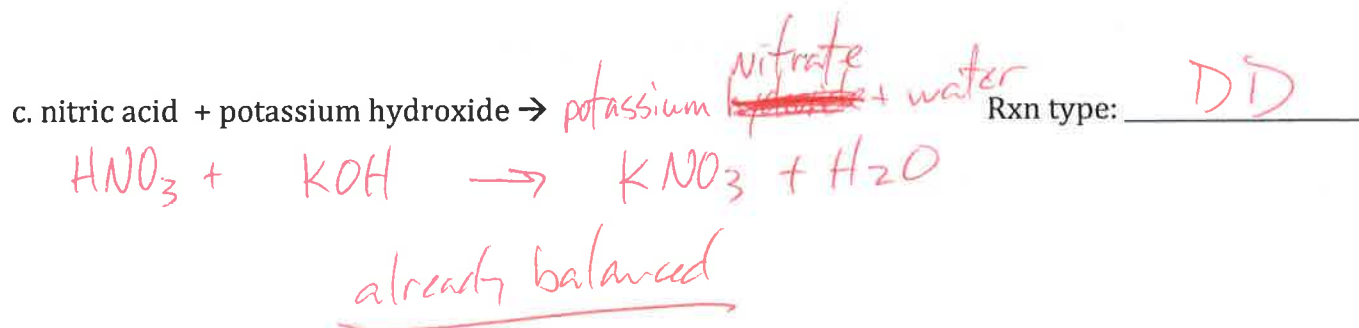
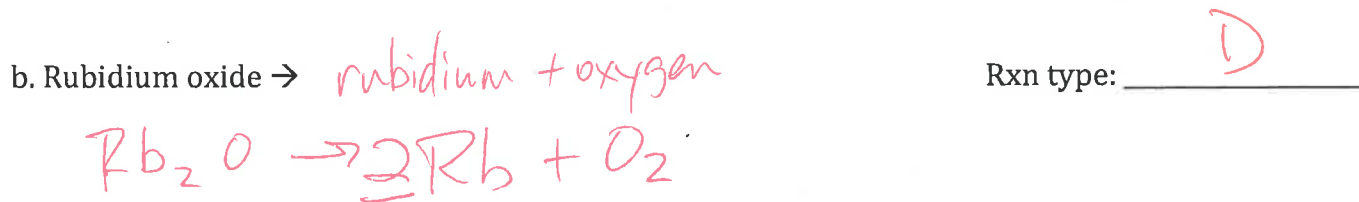
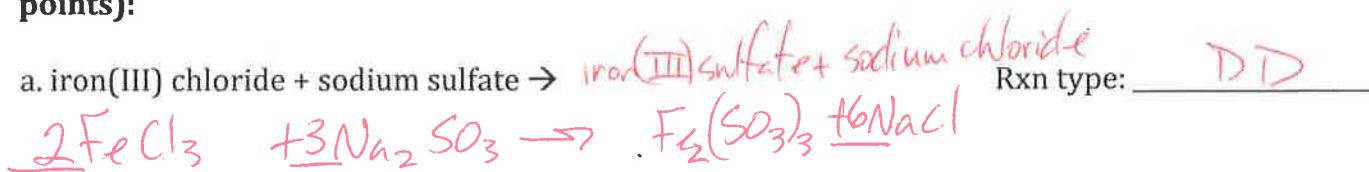
16. Draw an exothermic reaction pathway below. Label the following: *activation energy*  $E_a$ , *reactants*, *energy released*, *products*, *transition state* (6 points);



17. Predict the products of the following reactions. Identify the reaction type using "S" for synthesis, "D" for decomposition, "SR" for single replacement, "DR" for double replacement (12 points):



18. Convert the word equations to formula equations. Predict the products of the following reactions in both words and in formulas. Identify the reaction type, and balance the reactions (12 points):



Extra Credit (+2):

Pledge: \_\_\_\_\_