# Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_\_\_\_ Block \_\_\_\_\_\_ Reactions Study Guide

**Part 1: Balancing, Determining if a Reaction is Endothermic or Endothermic, Determining Type of Reaction**

Balance the reaction, determine if endothermic or exothermic, and determine the type of reaction. (Hint: If you see a polyatomic ion like (NO3) on both sides of the arrow (🡪) you can balance it as a whole unit)

**Video Help: Types of rxn Types of rxn with predicting Balancing Khan Balancing Endo/Exo w/ diagrams**

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Rxn Type:\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_Mg3N2 (s) + energy 🡪 \_\_\_\_Mg (s) + \_\_\_\_N2 (g) **endo or exo**

Rxn Type:\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_K2(CO3) (aq) + \_\_\_Ag(NO3) (aq) 🡪 \_\_\_Ag2(CO3) (s) + \_\_\_K(NO3) (aq) + energy **endo or exo**
2. \_\_\_\_CH4 (g) + \_\_\_\_ O2 (g) 🡪 \_\_\_\_CO2(g) + \_\_\_\_H2O (l) + energy **endo or exo**

Rxn Type:\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_Na(OH) (aq) + \_\_\_ H2(SO4) (aq) 🡪 \_\_\_Na2(SO4) (aq) + \_\_\_H(OH) (l) + energy **endo or exo**

Rxn Type:\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_Al (s) + \_\_\_\_Cu(NO3)2 (aq) 🡪 \_\_\_\_Cu (s) + \_\_\_\_Al(NO3)3 (aq) + energy **endo or exo**

Rxn Type:\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_ KClO3 (s) + energy 🡪 \_\_\_\_ KCl (s) + \_\_\_\_O2 (g) **endo or exo**

Rxn Type:\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_ C3H8 (g) + \_\_\_\_O2 (g) 🡪 \_\_\_\_CO2(g) + \_\_\_\_ H2O (l) + energy **endo or exo**

Rxn Type:\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_K2(SO4) (aq) + \_\_\_ Pb(OH)2 (aq) 🡪 \_\_\_ Pb(SO4) (s) + \_\_\_K(OH) (aq) + energy **endo or exo**

Rxn Type:\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_ Li (s) + \_\_\_\_Zn3(PO4)2 (aq) 🡪 \_\_\_\_Zn (s) + \_\_\_\_Li3(PO4) (aq) + energy **endo or exo**

Rxn Type:\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_Mg(NO3)2 (s) + energy 🡪 \_\_\_\_ MgO (s) + \_\_\_\_NO2 (g) + \_\_\_\_\_ O2(g) **endo or exo**

Rxn Type:\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Part 2: Describe**

1. What are indications of a chemical reaction?
2. How can a chemical reaction be made to occur faster? Explain.

**Soluble/Insoluble/net ionic**

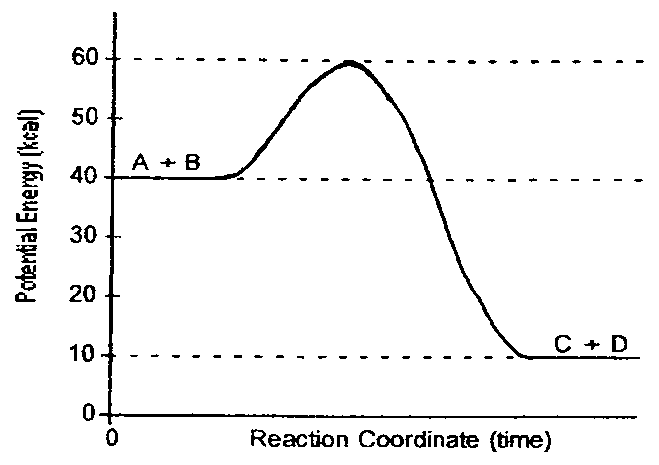
**Part 3: Determine if the following are soluble or insoluble and if a precipitate or an aqueous solution forms.**

1. CaCO3
2. Potassium iodide
3. NH4OH
4. PbSO4
5. Silver chloride
6. KC2H3O2

**Part 4: Determine Type, Predict Products, Balance & If double replacement determine the net ionic reaction**

1. \_\_\_FeCl3 (aq) + \_\_\_Hg(NO3)2 (aq)🡪
2. \_\_As + \_\_BaSO4 🡪
3. \_\_\_Zn + \_\_\_HCl🡪

22. \_\_\_\_C2H5OH + \_\_\_\_O2🡪



**Part 5: Potential energy path diagrams**

Figure 1

# Questions 23-25 refer to Figure 1

23. Is the reaction endothermic or exothermic?

24. How much activation energy is needed?

25. What is the Δ Hrxn?

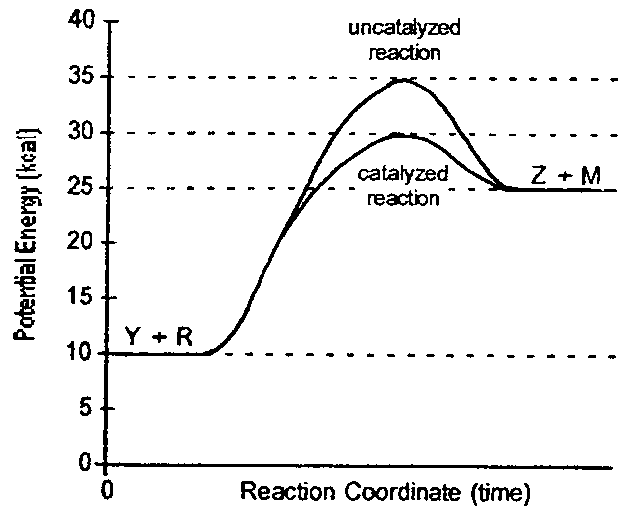
**Questions 26-32 refer to Figure 2**

Figure 2

26. Is the reaction endothermic or exothermic?

27. What is the value of the activation energy of the uncatalyzed reaction?

28. What is the value of the activation energy of the catalyzed reaction?

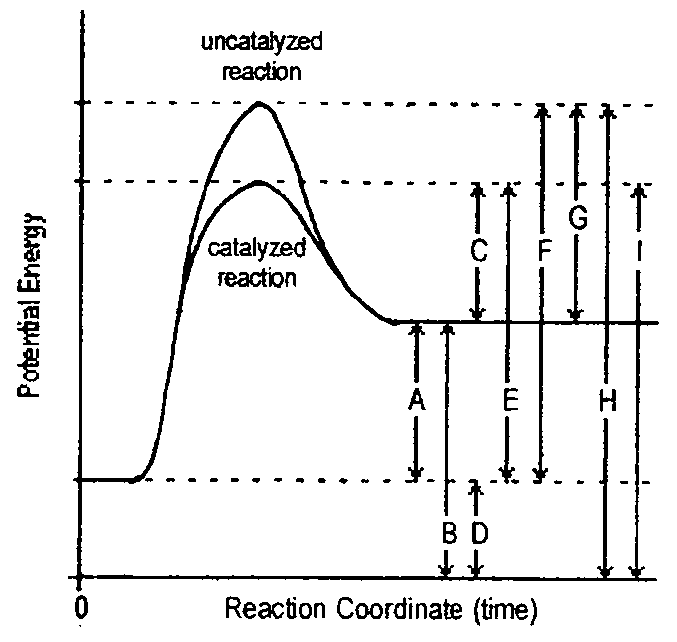
29. What is the ΔHrxn for the uncatalyzed reaction?

30. What is the ΔHrxn for the catalyzed reaction?

31. How does ΔH for the catalyzed compare to ΔH for the uncatalyzed reaction?

32. What is the purpose of adding a catalyst?

Figure 3

**Questions 33-39 refer to Figure 3.**

33. Potential energy of the reactants

34. Potential energy of the products

35. Activation energy of the catalyzed reaction.

35. Activation energy of the uncatalyzed reaction

39. Heat of reaction (ΔH).

**Part 6: Thermochemical equations**

40. How many grams of nitrogen dioxide is produced with 513 kJ of heat is used in the following reaction:

2N2O5 + 110 kJ 🡪 4NO2 + O2

41. How much heat is released when 15.31 g of sulfur dioxide react in:

2 SO2 + O2 🡪 2 SO3 + 198 kJ

42. How many moles of phosphoric acid is produced when 1157 kJ of heat is used in the following reaction:

P4O10 + 6 H2O 🡪 4H3PO4 + 424 kJ