

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

Balance the following chemical equations. If you see a polyatomic ion like (NO₃) on both sides of the arrow (→) you can balance it as a whole unit. If you **do** see a polyatomic ion like (NO₃), **draw a circle around it**. After you have balanced the equation underline the word energy and then tell whether the reaction is **endothermic or exothermic**.

Video Help: Types of rxn



Types of rxn with predicting



Balancing



Khan Balancing

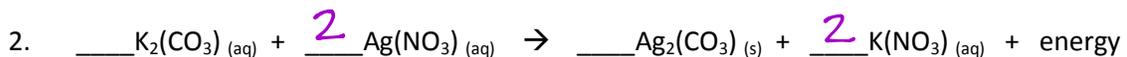


Endo/Exo w/ diagrams



endo / exo

Type of Reaction: Decomp



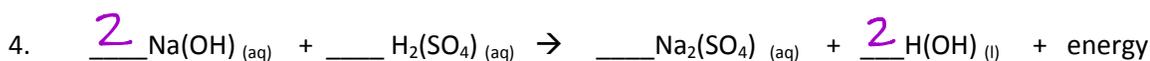
endo / exo

Type of Reaction: DR



endo / exo

Type of Reaction: COMBUST



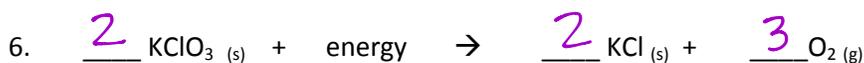
endo / exo

Type of Reaction: DR & Acid Base



endo / exo

Type of Reaction: SR



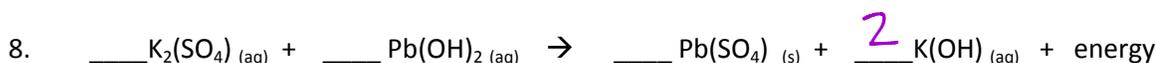
endo / exo

Type of Reaction: Decomp



endo / exo

Type of Reaction: Combust



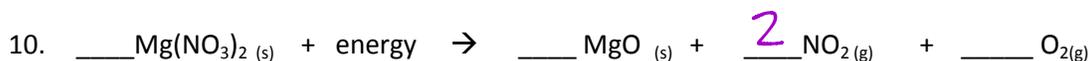
endo / exo

Type of Reaction: DR



endo / exo

Type of Reaction: SR



endo / exo

Type of Reaction: Decomp

* Soluble = dissolves in H₂O = (aq) ; insoluble = cannot dissolve in H₂O = precipitate = (s)

Part 2: Determine if the following are soluble or insoluble and if a precipitate or an aqueous solution forms.

11. CaCO₃ insoluble; precipitate

14. PbSO₄ insoluble; precipitate

Soluble/Insoluble/net ionic

12. Potassium iodide soluble; aqueous

15. Silver chloride insoluble; precipitate

13. NH₄OH soluble; aqueous

16. KC₂H₃O₂ soluble; aqueous

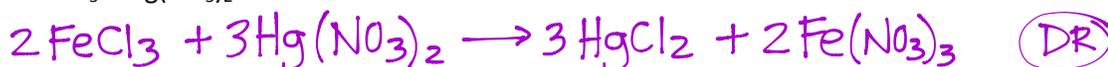


Part 3: Determine Type, Predict Products, Balance & If double replacement determine the net ionic reaction

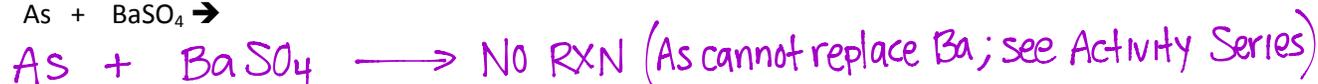
17. Zinc + hydrochloric acid →



18. FeCl₃ + Hg(NO₃)₂ →



19. As + BaSO₄ →

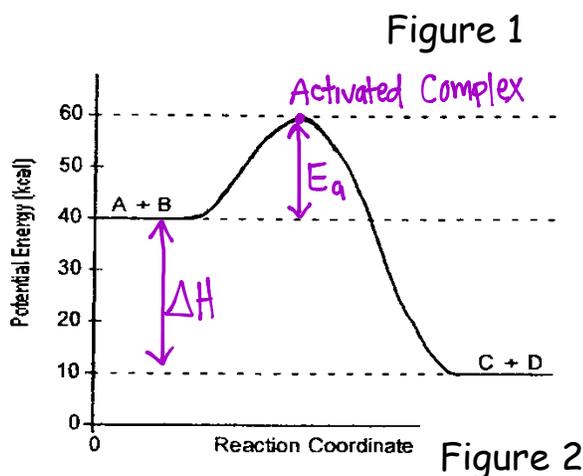


20. C₂H₅OH + O₂ →



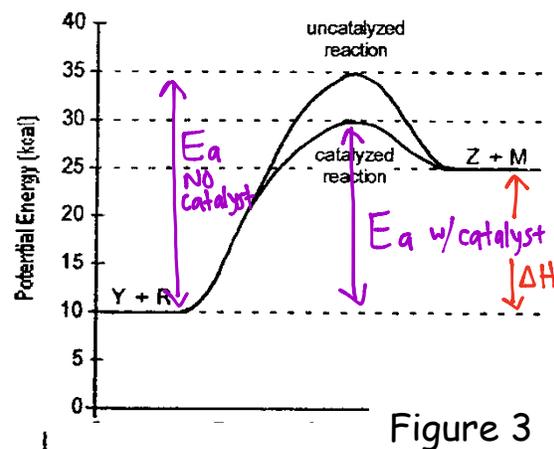
Questions 21-25 refer to Figure 1

21. Is the reaction endothermic or exothermic? **EXO**
22. What is the ΔH ? **$40 - 10 = 30 \text{ kcal}$**
23. What is the value of the activation energy? **$60 - 40 = 20 \text{ kcal}$**
24. What is the potential energy of the products? **10 kcal**
25. What is the potential energy of the activate complex? **60 kcal**



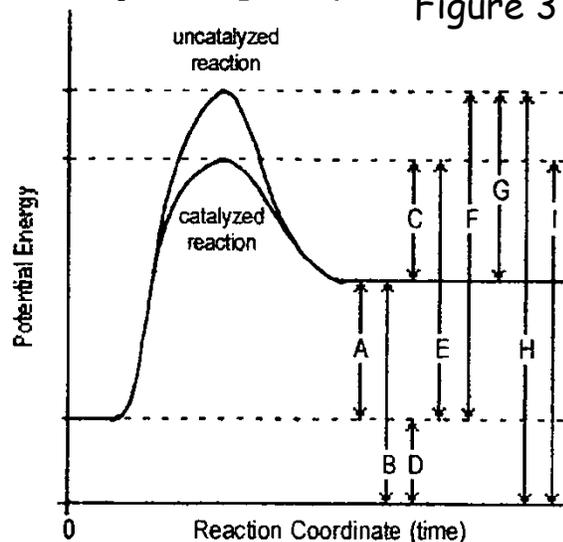
Questions 26-30 refer to Figure 2

26. Is the reaction endothermic or exothermic? **ENDO**
27. What is the value of the activation energy of the uncatalyzed reaction? **$35 - 10 = 25 \text{ kcal}$**
28. What is the value of the activation energy of the catalyzed reaction? **$30 - 10 = 20 \text{ kcal}$**
29. What is the potential energy of the activated complex of the catalyzed reaction? **30 kcal**
30. How does ΔH for the catalyzed compare to ΔH for the uncatalyzed reaction? (same, greater or less) **ΔH is same**



Questions 31-40 refer to Figure 3. For each question, give the letter of the arrow that represents the energy described.

31. Potential energy of the activated complex for the uncatalyzed reaction. **H**
32. Activation energy of the forward catalyzed reaction. **E**
33. Potential energy of the products of the forward reaction. **B**
34. Activation energy of the uncatalyzed reverse reaction. **G**
35. Potential energy of the activated complex for the catalyzed reaction. **I**
36. Activation energy of the uncatalyzed forward reaction **F**
37. Heat of reaction (ΔH). **A**
38. Activation energy of the catalyzed reverse reaction. **C**
39. Potential energy of the reactants of the forward reaction. **D**
40. What are the four indications that a chemical reaction has occurred?



1. color change
2. Energy change
3. gas produced (fizzing/bubbles/odor)
4. solid produced (precipitate)