

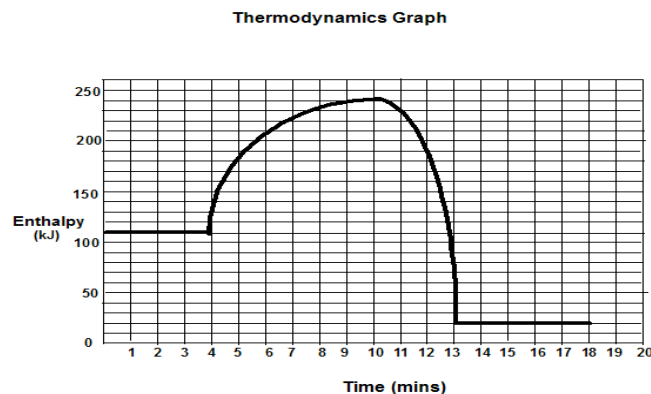
NAME: _____
PERIOD: _____ DATE: _____

Study guide Kinetics and nuclear chemistry

USE THE GRAPHS FOR THE FOLLOWING QUESTIONS

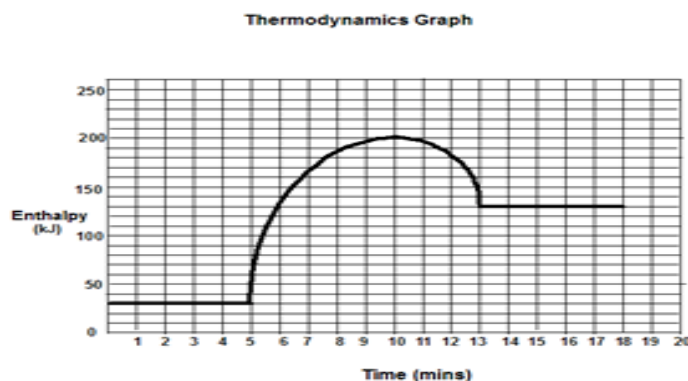
Use the first graphs for 1-8

1. This is a(n) (**endothermic/endothermic**) graph.
2. The surroundings are getting (**hotter/colder**).
3. The reaction is (**releasing/absorbing**) energy.
4. The enthalpy (H) of the reactants is _____ kJ.
5. The enthalpy (H) of the products is _____ kJ.
6. The change in enthalpy (ΔH) of the reaction is _____ kJ.
7. The activation energy of the reaction is _____ kJ.
8. The (**products/reactants**) have more potential energy.



Use the second graph for 9-15

9. This is an (**exothermic/endothermic**) graph.
10. The enthalpy (H) of the reactants is _____ kJ.
11. The enthalpy (H) of the products is _____ kJ.
12. The change in enthalpy (ΔH) of the reaction is _____ kJ.
13. The activation energy of the reaction is _____ kJ.
14. The surroundings are getting (**hotter/colder**).
15. The (**products/reactants**) have more potential energy.



16. Define reaction rate.
17. How is the reaction rate monitored?
18. What does a catalyst do?
19. How does a catalyst work?
20. Name three ways to slow a reaction down.
21. How does one of the methods used in question 20 work?
22. What two things need to happen in order for a reaction to be effective?

23. Define the following:

- | | | |
|-----------------|-------------------|------------------|
| a. Nucleon | d. Radioactivity | g. Critical mass |
| b. Isotope | e. Fission | h. Fusion |
| c. Strong Force | f. Chain reaction | |

24. Describe the differences between chemical reactions and nuclear reactions.

25. How do you know if an isotope is stable or not?

26. Write the nuclear symbol for the following:

- | | | | |
|---------------|---------------|-------------|---------------|
| a. Calcium-22 | b. Iodine-131 | c. Lead-210 | d. Curium-245 |
|---------------|---------------|-------------|---------------|

27. Fill in the table below:

Radiation type	Description	Symbol	Charge	Relative penetrating power
Alpha (α)				
Beta (β)				
Gamma (γ)				

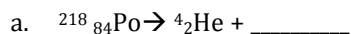
28. If an isotope undergoes decay, the radioactive particle is located on the _____ side of the equation. If an isotope is bombarded, the radioactive particle is located on the _____ side of the equation.

29. Fill in the table below

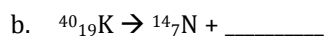
Summary of Radioactive Decay Processes

Type	Particle emitted	Change in mass number	Change in atomic number
Alpha decay			
Beta decay			
Positron emission			
Gamma emission			

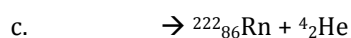
30. Write/complete the following balanced nuclear reactions



d. Oxygen-15 undergoes positron emission



e. Alpha decay of astatine-213



f. Nickel-60 undergoes gamma emission

31. What will decay to produce lead-206 and an alpha particle? Write the entire nuclear reaction.

32. What type of nuclear radiation is produced when potassium-43 decays to produce calcium-43?

33. Write the nuclear equation showing the radioactive decay of carbon-14 if it undergoes beta decay

34. How do nuclear reactors work? What are the advantages and disadvantages of nuclear power?

35. Why are fusion reactions hard to maintain?

36. How do we use carbon-14 for radioactive dating?

37. List and describe how radiation can be beneficial. \Fill in the blanks for the following decay series:

