

Name _____ Date _____ Class _____

CHAPTER 4 STUDY GUIDE FOR CONTENT MASTERY

Section 4.3 *continued*

Use the figures to answer the following questions.

Osmium 76 Os 190.2	Niobium 41 Nb 92.906
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27. What is the atomic number of osmium? 76
28. What is the chemical symbol for niobium? Nb
29. What is the atomic mass of osmium? 190.2
30. What units is the atomic mass reported in? atomic mass units
31. How many protons and electrons does an osmium atom have? A niobium atom?
osmium: 76 protons, 76 electrons; niobium: 41 protons, 41 electrons

Calculate the atomic mass of each element described below. Then use the periodic table to identify each element.

Isotope	Mass (amu)	Percent Abundance
⁶³ X	62.930	69.17
⁶⁵ X	64.928	30.83

Mass contribution = (mass)(percent abundance)
⁶³X: (62.930 amu)(69.17%) = 43.53 amu
⁶⁵X: (64.928 amu)(30.83%) = 20.02 amu
Atomic mass of X = 43.53 amu + 20.02 amu = 63.55 amu
The element is copper.

Isotope	Mass (amu)	Percent Abundance
³⁵ X	34.969	75.77
³⁷ X	36.966	24.23

Mass contribution = (mass)(percent abundance)
³⁵X: (34.969 amu)(75.77%) = 26.50 amu
³⁷X: (36.966 amu)(24.23%) = 8.957 amu
Atomic mass of X = 26.50 amu + 8.957 amu = 35.46 amu
The element is chlorine.

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CHAPTER 4 STUDY GUIDE FOR CONTENT MASTERY

Section 4.4 Changes to the Nucleus—Nuclear Reactions

In your textbook, read about radioactivity.

For each item in Column A, write the letter of the matching item in Column B.

Column A

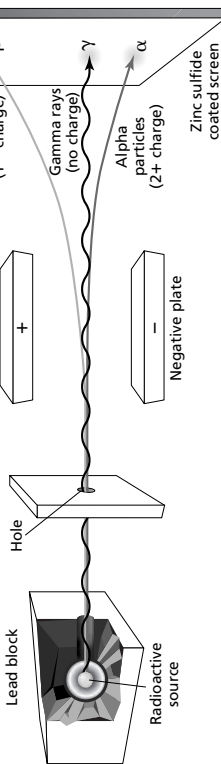
- c. _____ 1. The rays and particles that are emitted by a radioactive material
- a. _____ 2. A reaction that involves a change in an atom's nucleus
- d. _____ 3. The process in which an unstable nucleus loses energy spontaneously
- b. _____ 4. Fast-moving electrons

Column B

- a. nuclear reaction
- b. beta radiation
- c. radiation
- d. radioactive decay

In your textbook, read about types of radiation.

Use the diagram to answer the questions.



5. Which plate do the beta particles bend toward? Explain.
the positive plate, because beta particles are negatively charged
6. Explain why the gamma rays do not bend.
Gamma rays have no charge.
7. Explain why the path of the beta particles bends more than the path of the alpha particles.
The beta particles have less mass than the alpha particles and are more greatly affected by the electric field.

Complete the following table of the characteristics of alpha, beta, and gamma radiation.

Radiation Type	Composition	Symbol	Mass (amu)	Charge
8. Alpha	Helium nuclei, or alpha particles	${}^4_2\text{He}$	4	2+
9. Beta	Electrons, or beta particles	${}^0_{-1}\beta$	1/1840	1-
10. Gamma	High-energy electromagnetic radiation	${}^0_0\gamma$	0	0