

2 • Atoms and Elements

PRACTICE TEST

1. Certain properties are characteristic of metals.

Which property means that you can pound the substance into a foil?

- a) ductility c) sectility
b) conductivity d) malleability

2. Which of the following is a metalloid?

- a) As b) Ag c) S d) Pb e) He

3. Which of the following is a transition metal?

- a) Cl b) Ni c) P d) Ca e) C

4. Which of the following is an alkali metal?

- a) Mg b) Kr c) K d) Al e) H

5. Which of the following is a lanthanide?

- a) Xe b) Eu c) Cd d) P e) W

6. Which element has the highest melting point?

- a) Pb b) Au c) Os d) W e) Hg

7. Cathode rays start at the

- a) negative electrode c) positive electrode
b) power source d) gas inside the tube

8. Canal rays are

- a) neutrons c) positive ions
b) protons d) electrons

9. Listed below are the charges and masses of four particles. Which one will be deflected the **least** in a mass spectrometer?

- a) +2, 2 amu c) +1, 1 amu
b) +4, 4 amu d) +1, 4 amu

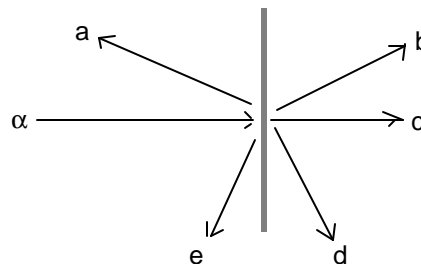
10. In a Millikan oil drop type experiment, the charge on four oil drops (in Coulombs) was found to be:

- 3.33 Coulombs
8.88 Coulombs
6.66 Coulombs
11.10 Coulombs

What is the charge on the electron according to this experiment?

- a) 1.11 Coulomb c) 4.44 Coulomb
b) 2.22 Coulomb d) 11.10 Coulomb

11. Pictured below is a schematic of the Rutherford experiment. Which scattered α -particle gives the best evidence for the nuclear atom?



- a) a b) b c) c d) d e) e

12. Which of the following is an isotope of the element with 20 protons ($p=20$) and 22 neutrons ($n=22$)?

- a) titanium-22 c) calcium-40
b) zirconium-40 d) titanium-48

13. The imaginary element X has the following natural abundances and isotopic masses. What is the atomic weight of X?

$^{24}_{12}\text{X}$	24.02 amu	40.0%
$^{26}_{12}\text{X}$	26.10 amu	60.0%

Show your work:

For questions 14 - 18, use the following key:

(each answer may be used once, more than once, or not at all)

- a) alpha
- b) beta
- c) gamma
- d) alpha and beta, but not gamma

- 14. A high energy form of light
- 15. Associated with a neutron changing into a proton
- 16. A high speed electron
- 17. Used by Ernest Rutherford as a “probe”
- 18. Most penetrating of the “Bequerel Rays”

For questions 19 - 22, use the following key:

(each answer may be used once, more than once, or not at all.)

- a) John Dalton
- b) Ernest Rutherford
- c) J.J. Thomson
- d) Democritus

- 19. His model of the atom has been called the “billiard ball” model.
- 20. He studied matter in cathode ray tubes.
- 21. His philosophical idea included the term “atomos”.
- 22. He added to the atomic theory the idea that atoms had positive and negative parts.

23. Consider the following notation: ${}^{220}_{86}\text{Rn}$

Which statement below is correct?

- a) This particle contains 86 protons
- b) This particle has a mass number of 86
- c) This particle has an atomic number of 220
- d) This particle contains 220 neutrons

24. Which elements did Mendeleev leave spaces for in his periodic table?

25. If copper metal is a mixture two isotopes, Cu-63, mass = 62.9298 u and Cu-65, mass = 64.9278 u. The molar mass of copper is 64.546 g/mole. Calculate the % abundances of the two isotopes of copper. Show your work.

Just For Fun:

Element names finish these sentences.

- A ridiculous inmate is a ____.
- I bumped my ____ the car door.
- I am sad when all the flowers ____.
- What the police officer does to the crook. ____
- What the doctor does to the patient. ____
- What the undertaker does if the doctor doesn't succeed. ____
- If your cattle get away, ____.
- A famous London theatre is the ____.
- Demonstrations help keep the lectures from getting ____.
- Linoleum, tile, and hardwood are three types of ____.