## 2 • Atoms and Elements

 Certain properties are characteristic of metals. Which property means that you can pound the substance into a foil? can cut

ductility wises

sectility

b) conductivity

malleability Pound into SHEET)

Which of the following is a metalloid?

a) As

b) Ag

c) S

e) He

3. Which of the following is a transition metal?

a) Cl

b)) Ni

c) P

d) Ca

d) Pb

e) C

4. Which of the following is an alkali metal?

a) Mg

b) Kr

d) Al

e) H

5. Which of the following is an lanthanide?

a) Xe

b) Eu

c) Cd

d) P

e) W

6. Which element has the highest melting point?

c) Os

Cathode rays start at the

a) negative electrode
 e) positive electrode

b) power source

gas inside the tube

Canal rays are

a) neutrons

positive ions

b) protons

electrons

Listed below are the charges and masses of four particles. Which one will be deflected the least in a LARGE MASS mass spectrometer? SMALL CHARGE

a) +2, 2 amu

c) +1, 1 amu

b) +4, 4 amu

+1, 4 amu

## PRACTICE

common

In a Millikan oil drop type experiment, the charge on four oil drops (in Coulombs) was found to be: Smalles7

- by 3.33

3.33 Coulombs

8.88 Coulombs

6.66 Coulombs

3, 33 11.10 Coulombs

What is the charge on the electron according to this 3.33= 3 4-15 experiment?

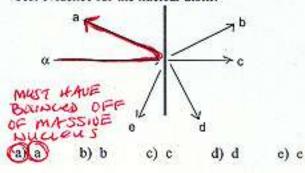
a) 1.11 Coulomb

c) 4.44 Coulomb

b) 2.22 Coulomb

d) 11.10 Coulomb

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



12. Which of the following is an isotope of the element with 20 protons (p=20) and 22 neutrons (n=22)? = Ca - 42

a) titanium-22

calcium-40 c))

b) zirconium-40

titanium-48

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

24 X 24.02 amu 40.0%

26 X

26.10 amu

60.0%

(.400) (24,02 anu) + (.600) (26.10 ann) = 25.268 = 25.30 ama

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
- C 14. A high energy form of light

NOT ON TEST &

- 6 15. Associated with a neutron changing into a proton
- B 16. A high speed electron
- A 17. Used by Ernest Rutherford as a "probe"
- C 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
- A 19. His model of the atom has been called the "billiard ball" model.
- C 20. He studied matter in eathode 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 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?

Ga

Ge

Sc

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.

62.9298 x + 64.9278(1-x) =64.546 and 62.9298 x + 64.9278-64, 9278 x = 64.546 and

## Just For Fun:

Element names finish these sentences.

- A ridiculous inmate is a Si.
- I bumped my !!e the car door.
- I am sad when all the flowers Ar.
- What the police officer does to the crook.
- What the doctor does to the patient. Cm or He
- What the undertaker does if the doctor doesn't succeed.
   Ba
- If your cattle get away, <u>Fu</u>
- A famous London theatre is the Pd.
- Demonstrations help keep the lectures from getting
  - Linoleum, tile, and hardwood are three types of F