

Midterm Study Guide

- 58 km = _____ mm
 - .058
 - 58,000
 - 5.8×10^6
 - 5.8×10^7
 - 58×10^{-3}
- Which of the following temperatures on the Kelvin scale corresponds to 25 °C?
 - 273 K
 - 298 K
 - 350 K
 - 212 K
 - 100 K
- Ralph is in the lab doing an experiment. Which of the following activities is unsafe?
 - He mixes an acid and a base
 - He dilutes an acid by adding the water first
 - He is synthesizing paste and he tastes it to see if it is the right compound
 - He uses the emergency shower after spilling acid all over himself
- What is the correct way to write 3,450,000 in scientific notation?
 - 3.45×10^{-6}
 - 3.45^6
 - 3.45×10^6
 - 34.5×10^7
 - 3.45×10^4

Substance	Density
Gold	19.3 g/cm ³
Aluminum	2.70 g/cm ³
Mercury	13.6 g/cm ³
Lead	11.4 g/cm ³
Lithium	0.53 g/cm ³

Figure 1

- You find an unknown metal that sinks in water. You find the mass of 45 cm³ of the metal to be about 120 g. Based on the data from Figure 1 what is the metal?
 - Gold
 - Aluminum
 - Mercury
 - Lead
 - Lithium
- Which metals will float on mercury?
 - Lithium
 - Aluminum
 - Lead
 - A & B
 - All of the above
- Which of the following statements about solids, liquids and gases is **not** true?
 - Solids have a definite volume but not a definite shape
 - Liquids will assume the shape of their container
 - Gas molecules are spread apart and move rapidly
 - Gases will assume the shape of their container
 - Changing from a solid to a liquid is a physical change

Identify the following as physical changes or properties. For a physical property put a; for a chemical property put b.

- Nickel I chloride is green. _____
- Sodium is a very active metal _____
- Acetylene is flammable. _____
- Water has a freezing point of 0°C. _____

Identify the following as chemical or physical changes. For a physical change put a; for a chemical change put b.

13. Gallium melts _____
14. A balloon expands and pops. _____
15. Magnesium replaces silver in silver nitrate _____
16. Ammonium nitrate explodes _____

Use these choices for 17-21

- a. Element
- b. Compound
- c. Homogeneous mixture
- d. Heterogeneous mixture

17. Cobalt is a(n) _____
18. Carbon Dioxide is a(n) _____
19. A strawberry banana Jamba Juice is a(n) _____
20. Sugar water is a(n) _____

21. How many neutrons are in Carbon-14?

- a. 6
- b. 5
- c. 12
- d. 8
- e. 7

22. What is the best definition of atomic mass?

- a. The average mass of all the isotopes of an atom.
- b. The number of protons plus the number of neutrons
- c. The mass of an atom's most stable nucleus
- d. The mass of an atom's electrons
- e. The mass of 1000 atoms

23. What did Rutherford discover about the atom?

- a. That it had electrons
- b. That it has quarks, bosons, and fermions
- c. That it is mostly empty space with a positively charged nucleus
- d. That atoms cannot be created or destroyed.

24. What is the formula for Nickel(I) Sulfide?

- a. Ni_2S
- b. NiSO_4
- c. Ni_2SO_4
- d. NiS
- e. Ni_3S_2

25. According to the law of conservation of mass, which of the following is true?

- a. The number of moles of the products equals the number of moles of the reactants.
- b. The mass of the products equals the mass of the reactants
- c. Extra mass is always converted to gas
- d. The mass of a compound depends only upon temperature.

26. Which of the following elements is a semimetal?

- a. Germanium
- b. Sulfur
- c. Krypton
- d. Niobium
- e. Strontium

27. Which of the following elements is a halogen?

- a. Barium
- b. Antimony
- c. Phosphorus
- d. Bromine
- e. Radon

28. What is **not** true about the halogens?
- They are in group 17
 - They are highly reactive
 - They tend to form anions of a -1 charge
 - They form compounds with the alkali metals
 - They are all gases at room temperature.
29. Where do you find most of an atom's mass?
- In the electrons
 - In the space between the nucleus and the electrons
 - In the nucleus
 - It is all evenly distributed
 - You can't predict the location of mass at any one instant
30. What are some reasons for error in experimental measurements?
- The precision of the equipment is limited
 - The chemicals being used may have traces of impurities
 - Other factors like atmospheric pressure and buoyancy may not be accounted for
 - All of the above
 - There should never be errors in measurements
31. What elements are most likely to form covalent bonds?
- Two metals
 - A metal and a nonmetal
 - Two noble gases
 - Two elements with a high electronegativity
 - Strontium and Mercury
32. How was the quantity of one mole determined?
- It is just a guess
 - One mole of Carbon-12 atoms was set to be exactly 12 grams.
 - It is the number of moles in a liter of water
33. Which of the following elements is not radioactive?
- Polonium-209
 - Curium-247
 - Krypton-84
 - Carbon-14
 - Protactinium-234
34. What are isotopes?
- Radioactive elements
 - Atoms with the same number of protons and a different number of neutrons
 - Molecules with the same chemical formula but different shapes
 - Homogeneous mixtures that have an increased boiling point
35. What is the best instrument to measure volume?
- A disposable pipette
 - A triple beam balance
 - An open ended manometer
 - A barometer
 - A graduated cylinder
36. What is the charge of a Sulfide ion?
- -1
 - -2
 - -3
 - $+1$

- 40. As a consequence of the discovery of the nucleus by Rutherford, which model of the atom is believed to be true?**
- A model in which the nucleus is made of protons, electrons and neutrons
 - A model in which the region around the nucleus is largely empty space in which the electrons are situated.
 - A model in which the nucleus is made of electrons and protons
 - A model in which the nucleus is made of neutrons only
 - A model in which the protons and neutrons compose the nucleus.

41. Select the correct statement about subatomic particles.
- Neutrons have no charge and are the lightest subatomic particle.
 - Electrons, protons, and neutrons all have the same mass.
 - Protons are positively charged, found in the nucleus and the lightest subatomic particle
 - Electrons are negatively charged, occupy most of the volume and are the lightest subatomic particle.

42. The nucleus of an atom is _____.

- A) Negatively charged and has a low density. C) positively charged and has a low density.
B) Positively charged and has a high density. D) negatively charged and has a high density.

43. In which of the following sets are the symbol of the element, the number of protons, and the number of electrons given correctly?

- a. F, 19 protons, 19 electrons d. Zn, 30 protons, 60 electrons
b. Cs, 55 protons, 132.9 electrons e. In, 49 protons, 49 electrons
c. He, 4 protons, 4 electrons

44. All atoms are _____.

- positively charged, with the number of protons exceeding the number of electrons
- neutral, with the number of protons equaling the number of neutrons, which is equal to half the number of electrons
- negatively charged
- neutral, with the number of protons equaling the number of electrons

45. In which of the following is the number of neutrons correctly represented?

- $^{24}_{12}\text{Mg}$ has 24 neutrons
a. $^{19}_9\text{F}$ has 0 neutrons
b. $^{238}_{92}\text{U}$ has 146 neutrons
c. $^{75}_{33}\text{As}$ has 108 neutrons
d. $^{197}_{79}\text{Au}$ has 79 neutrons

46. How do the isotopes hydrogen-1 and hydrogen-2 differ?

- Hydrogen-1 has no protons; hydrogen-2 has one.
- Hydrogen-2 has one neutron; hydrogen-1 has none.
- Hydrogen-2 has two protons; hydrogen-1 has one.
- Hydrogen-2 has one more electron than hydrogen-1.

47. Isotopes of the same element have different _____. (Choose all that apply!)

- a. mass numbers B) number of protons C) number of neutrons D) mass E) Symbols

48. Which of the following equals one atomic mass unit?

- One gram
- One-twelfth the mass of one carbon atom
- The mass of one helium atom
- The mass of one electron

49. Give the name or formula of the following substances

- | | |
|----------------------|-------------------------|
| a. Calcium Chloride | Chemical formula: _____ |
| b. NaOH | Chemical name: _____ |
| c. K_2S | Chemical name: _____ |
| d. SBr_6 | Chemical name: _____ |
| e. Br_2O_7 | Chemical name: _____ |
| f. $(NH_4)_2Cr_2O_7$ | Chemical name: _____ |
| g. NH_4NO_3 | Chemical name: _____ |
| h. H_3PO_4 | Chemical name: _____ |
| i. $Ba(ClO_4)_2$ | Chemical name: _____ |

50. Convert 50 g to nanograms.

51. Convert 100ug to grams.

52. Convert 3×10^{24} meters to Megameters?