

Midterm Study Guide Key

- 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. P
- Sodium is a very active metal. C
- Acetylene is flammable. C
- Water has a freezing point of 0°C. P

$$\frac{120g}{45cm^3}$$

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

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

Use these choices for 17-21

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

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

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_3S
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 _____.
- Negatively charged and has a low density.
 - Positively charged and has a high density.
 - positively charged and has a low density.
 - 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?
- F, 19 protons, 19 electrons
 - Cs, 55 protons, 132.9 electrons
 - He, 4 protons, 4 electrons
 - Zn, 30 protons, 60 electrons
 - In, 49 protons, 49 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
 - $^{19}_9\text{F}$ has 0 neutrons
 - $^{238}_{92}\text{U}$ has 146 neutrons
 - $^{75}_{33}\text{As}$ has 108 neutrons
 - $^{197}_{79}\text{Au}$ 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!)
- mass numbers
 - number of protons
 - number of neutrons
 - mass
 - 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: CaCl_2

b. NaOH

Chemical name: sodium hydroxide

c. K_2S

Chemical name: potassium sulfide

d. SBr_6

Chemical name: sulfur hexabromide

e. Br_2O_7

Chemical name: dibromine heptoxide

f. $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$

Chemical name: ammonium dichromate

g. NH_4NO_3

Chemical name: ammonium nitrate

h. H_3PO_4

Chemical name: phosphoric acid

i. $\text{Ba}(\text{ClO}_4)_2$

Chemical name: barium perchlorate

50. Convert 50 g to nanograms.

$$\frac{50 \text{ g}}{1} \times \frac{10^9 \text{ ng}}{1 \text{ g}}$$

$$\boxed{5 \times 10^{10} \text{ ng}}$$

51. Convert 100 μg to grams.

$$\frac{100 \mu\text{g}}{1} \times \frac{1 \text{ g}}{10^6 \mu\text{g}}$$

$$\boxed{10^{-4} \text{ g}}$$

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

$$\frac{3 \times 10^{24} \text{ m}}{1} \times \frac{1 \text{ Mm}}{10^6 \text{ m}}$$

$$\boxed{3 \times 10^{18} \text{ Mm}}$$