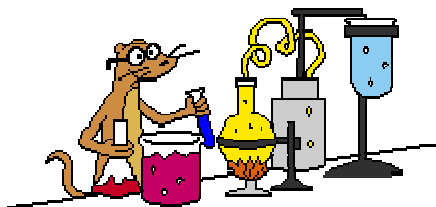


# Review for Chemistry I FINAL EXAM



1. What is the first (and largely most important) step of the **scientific method**?
2. Identify the **compressibility** and **density** of gases compared to liquids compared to solids.
3. List 6 **physical properties**. Then, give an example of each that shows you understand those properties.
  - a.
  - b.
  - c.
  - d.
  - e.
  - f.

4. List 6 **physical changes (the physical changes of state)**. Then, give an example of each that shows you understand those changes.

a.

b.

c.

d.

e.

f.

5. List 3 **chemical properties**. Then, give an example of each that shows you understand those properties.

a.

b.

c.

6. List 3 **chemical changes**. Then, give an example of each that shows you understand those changes.

a.

b.

c.

7. Describe the difference between a **heterogeneous** mixture and a **homogeneous** mixture. Give one example of each.

8. What is the fundamental difference between a **mixture** and a **compound**?

9. What is the **Law of Conservation of Mass**. Give an example.

10. What is the representative particle for:

Element:

Covalent compound:

Ionic compound:

11. What are the 5 principles which make up **Dalton's Atomic Theory**? Which are still *true today*?

a.

b.

c.

d.

e.

12. What is an **isotope**? Give an example and explain.

13. What was **Rutherford's** model of the atom and what experiment did he do?

14. What did **Millikan's Oil Drop** experiment show? What did he do?
15. What's the difference between a **group** and a **period** on the periodic table?
16. What are the **halogens** and how many valence electrons do they have?
17. What type of ions end in **-ide**?
18. Describe the *physical properties* of **covalent compounds**.
19. Describe the *physical properties* of **ionic** compounds.
20. How do you know when you have a **polyatomic ion**?
21. Write the correct formulas for the following. Remember, if IONIC, include charges.
- sodium phosphate
  - cobalt (II) chloride
  - calcium hydroxide
  - iron (III) sulfate
  - carbon tetrachloride

- f. silicon dioxide
- g. manganese (VI) acetate
- h. rubidium nitrite
- i. lithium phosphide
- j. magnesium sulfide
- k. barium phosphate

l.

22. What does the **principal quantum number** for an atom represent?

23. Draw a representative **p** orbital.

24. Draw an **orbital diagram** showing a double bond between 2 oxygen atoms.

25. Draw, using x, y axes, a  **$\sigma$**  bond.

26. Draw, using x, y axes, a  **$\pi$**  bond.

27. Write the **complete electron configuration** for *bromine*.

28. Write the **outer shell electron configuration** for *calcium*.
29. Write the **complete electron configuration** for *fluorine*.
30. How many valence electrons are in:
- a. Hydrogen
  - b. Magnesium
  - c. Carbon
  - d. Chlorine
  - e. Fluorine
  - f. Neon
  - g. Nitrogen
  - h. Potassium
31. What is the *formula used* to calculate the **frequency of light**?
32. What is the **speed of light** (include units)?
33. What is the *formula used* to calculate the **energy** of an photon?
34. What is **Planck's constant**?

35. Put these electromagnetic radiations in order from LOWEST to HIGHEST energy. Put 1 for lowest and 7 for highest.

Gamma waves

Radio waves

Visible light

Ultraviolet light

Infrared light

X rays

Microwaves

36. What is an **isomer**? Draw examples of several isomers for the same chemical formula.

37. What is an **alloy**? Give several examples and what metals make up each alloy.

38. Who is **Heisenburg** and why is he important?

39. What is **resonance**? Draw an example of resonant structures.