

Phys Sc 416/30

Pretest 4.3 Test will be based on all of the underlined review topics listed below and other flashback topics.

Environment

1. Match the chemical or technology with the associated environmental problem.

- | | | | |
|----|-----------------|-------|-----------------------------|
| a. | CO ₂ | _____ | 1. Acid rain |
| b. | SO ₂ | _____ | 2. Global warming |
| c. | CFC's | _____ | 3. Ozone depletion |
| d. | CH ₄ | _____ | 4. Soil and water pollution |
| e. | NO ₂ | _____ | |
| f. | Hg | _____ | |

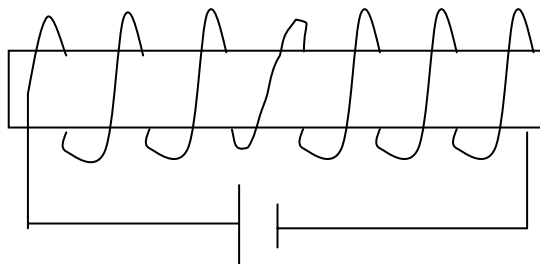
g. _____ and _____ and _____ and no room for you in environmental



heaven!

Magnetism

2. Indicate 2 places in the diagram where you would be able to place a compass and see it point to the **right**.



Conductors and Insulators

3. **True? Or False?**

- Plastic is an insulator, meaning that it is a poor conductor of heat and electricity.____
- Copper and silver are better conductors than aluminum and tungsten_____
- To avoid extra resistance, it is better to use a longer wire than necessary_____
- To improve conductance, one should use as thin a wire as possible_____
- Placing electrical wires next to a heat source is a good idea since it will improve conductance_____

The Joule Effect

4. How much power is lost if a high tension wire uses 50 000 V to transmit 100 000 W of power? (R for the high tension wire = 1000 Ω)

Models of the Atom

5. TRUE? Or FALSE?
- a. According to Democritus, the atom is a small, dense, indivisible sphere.
 - b. According to Thomson, the atom is a sphere in which the positive charges are concentrated in a nucleus and the negative charges surround the nucleus.
 - c. According to Rutherford, the atom is a positive sphere in which the negative charges are evenly distributed throughout.
 - d. According to Bohr, the atom is a sphere in which the positive charges are concentrated in a nucleus and the negative charges travel around the nucleus in orbits.
6. Following his experiments dealing with the deflections of alpha particles passing through a thin sheet of gold foil, Rutherford modified the atomic model Thomson had proposed.

Which two of the following statements derive directly from Rutherford's experiments?

- 1- The number of protons is equal to the number of electrons.
- 2- The electrons are contained in a positive sphere made up of protons.
- 3- Protons are concentrated in a very small positive area in the center of the atom.
- 4- Electrons move about in specific orbits.
- 5- An atom contains a very large amount of empty space.

Answer: ____ and _____

Preparing Solutions (Includes Dilution)

- 7. How many grams of KOH are needed to make 200 mL of a 3g /L solution. Outline the steps in used in the laboratory.
- 8. Given 20 L of a 4 mole/L of NaOH solution, how would you prepare 1.0 L of a 1.6 g/L solution? (belongs to 430 part of course)
- 9. How would you prepare three solutions representing the three types of electrolytes?

Circuits

- 10. How do you connect three 12 Ω resistors so that your total resistance is 4 Ω ?

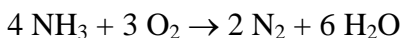
Phys Sc 430
Pretest 4.3 (430 part)

Periodic Trends

1. TRUE? Or FALSE?
 - a. In Period 2, electronegativity increases as the atomic number increases.
 - b. In Period 2, ionization energy decreases as the atomic number increases.
 - c. In Period 2, atomic radius does not change as the atomic number increases.
 - d. In group 1 (alkali metals), boiling points decrease and then increase as the atomic number increases.

Stoichiometry

1. Nitrogen gas and water vapour are produced when ammonia gas, NH_3 , reacts with oxygen gas according to the following balanced chemical equation:



Calculate the mass of oxygen gas needed to produce 0.378 g of nitrogen gas.

2. Define the term 'molecular molar mass'.
3. How many atoms of oxygen are in a mole of ozone, O_3 ?