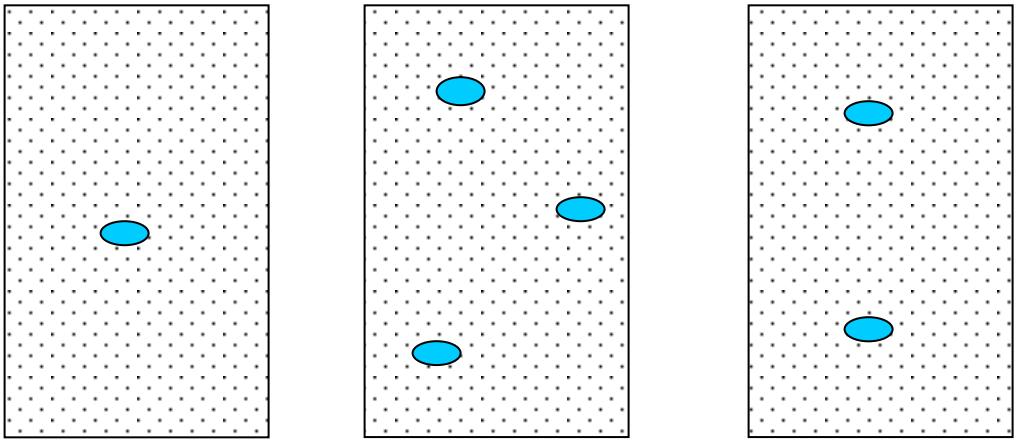
ST Pretest 1.3

<u>Topics to study</u>: Solutions Intro, Concentration (m/V %, g/L and ppm), Electrolytes, nonelectrolytes

1. a) Which of the following is the most concentrated?

= 2 g of solute



MOST conc.

b) If each solution above has a volume of 3.0 L, find the concentration of each solution in g/L.

2g/3 L = 0.67 g/L 6g/3 L = 2 g/L (2+ 2)g/3 L = 1.3 g/L

c) Give an example of a non-solid solute in water.
gas(such as CO_2 in champagne)

d) If a positive ion dissolves in water which part of the water molecules will be facing the ion? Why?

The oxygen atoms from the water molecules because they have a partially negative charge.

2. Express the concentration in both g/L and ppm.

Mass of solute	Volume of solution	g/L	Ppm = mg/L
35 mg	2.0 L	0.035 g/2.0 L = 0.0175 g/L	35mg/2L = 17.5 ppm
0.45 g	500.0 ml	0.45 g/0.5 l = 0.90 g/L	450mg/0.500 L = 900 ppm

3. If the density of CCl4 liquid is 1.2 g/ml, what will its m/V% be if 20 ml of it are mixed with 80 ml of oil?

Total volume = 20 + 80 ml = 100 ml
Mass of CCl4 liquid = 20 ml* 1.2 g/ml = 24 g

% = 24g/100 ml * 100% = 24 %

4. a) A fish farmer wants to create a 100 000 L pond with a 30 g/L concentration of salt. How many kg of salt does he have to buy?

Since C= m/V then
m = CV = 30 g/L(100 000 L) = 3 000 000 g = 3000 kg

b) For a different type of fish, he needs a concentration of only 200 ppm of salt. How many kg of salt does he have to buy for this other 100 000 L pond?

Since C= m/V then
m = CV = 200 mg/L(100 000 L) = 20 000 000 mg = 20 000 g =20 kg

5. Classify as metal, non-metal, or metalloid or noble gas.

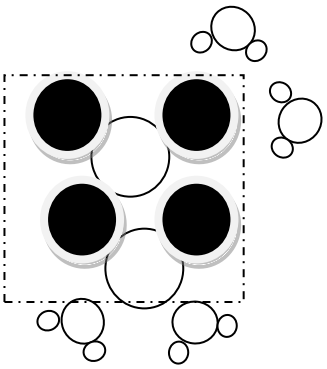
a) A substance with loose electrons and which includes a family of low melting elements_____
b) Used in computers, this substance is a semi-conductor_____
c) It is lustrous but not malleable_____
d) You could use the acid test to distinguish between Si and an element from this category_____
e) It is a poor conductor of electricity_____
f) Very unreactive, it is also not a good conductor_____
g) It forms negative ions when reacting with element # 11_____

Answers
a)metal
b)metalloid
c)metalloid
d)metal
e)nonmental
f)noble gas
g)nonmetal

6. Where precisely are metalloids located in the periodic table?

Along the staircase. Of those elements, only Al is not a metalloid.

7. Draw a $CaCl_2$ crystal dissolving in water.



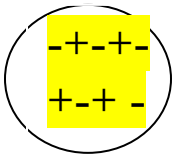
The solid crystal is within the broken lines of the square. The large black circles are chloride ions being attacked by the partially positive hydrogen atoms of the water molecule.

Flashback(questions form previous tests)

8. What name is given to periodic table elements that are semi-conductors of electricity and which do not react with acid?___metalloids__

9. Draw a Lewis structure for oxygen. Draw six dots around the oxygen.

10. Draw a Thomson model of the boron atom.



11. When some charcoal(C) burned, it reacted with 320 grams of oxygen gas (O_2). If 440 g of CO_2 were made, how many grams of charcoal reacted?

$C + O_2 \rightarrow CO_2$ $x + 320 = 440;$ $x = 120$ g