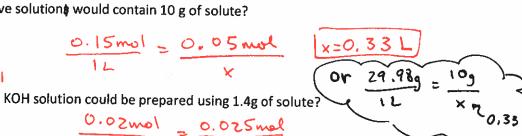## Molarity Review

Name: Answers.

Round to significant figures. Finish for homework. Finish for next class please.
Will count towards a homework mark (done/not done)

1. What volume of a 0.15M $CaBr_2$ solution would contain 0.25 moles of solute?

$$\frac{0.15 mol}{1 L} = \frac{0.25 mol}{x} \qquad \boxed{x = 1.\bar{6} \, L}$$

2. What volume of the above solution would contain 10 g of solute?

$$\frac{1 mol}{x} = \frac{199.88 g}{10 g}$$

$$x = 0.05 mol$$

$$\frac{0.15 mol}{1 L} = \frac{0.05 mol}{x} \qquad \boxed{x = 0.33 \, L}$$

or $\frac{29.98 g}{1 L} = \frac{10 g}{x}$ → 0.33 L

3. What volume of a 0.02M KOH solution could be prepared using 1.4g of solute?

$$\frac{1 mol}{x} = \frac{56.11 g}{1.4 g}$$

$$x = 0.025 mol$$

$$\frac{0.02 mol}{1 L} = \frac{0.025 mol}{x}$$

$$x = 1.2475... \qquad \boxed{1 \, L}$$

4. What mass of magnesium hydroxide is needed to make 4.0L of a 0.050M solution?

$$\frac{0.050 mol}{1 L} = \frac{x}{4.0 L}$$

$$x = 0.2 mol$$

$$\frac{1 mol \, Mg(OH)_2}{0.2 mol} = \frac{58.33 g}{x}$$

$$x = 11.666 g \rightarrow \boxed{12 g}$$

5. What is the molarity of a solution in which 2.20g of carbon dioxide are dissolved in 150mL of solution?

$$\frac{1 mol}{x} = \frac{44.01 g}{2.2 g}$$

$$x = 0.050 \, mol \, CO_2$$

$$\frac{0.050 mol}{0.150 L} = \frac{x}{1 L} \qquad x = 0.3333 \, mol$$

$$\boxed{[CO_2] = 0.333 M}$$

6. Find the resulting concentration of a solution made by mixing 40mL of 0.6M NaCl with 20mL of water.

$$\frac{0.6 mol}{1 L} = \frac{x \, mol}{0.040 L}$$

$$x = 0.024$$

$$\frac{0.024 mol}{0.060 L} = \frac{x}{1 L}$$

100mL $\quad x = 0.4$

or $c_1 V_1 = c_2 V_2$

$(0.6)(40) = c_2 (60)$

$$\boxed{c_2 = 0.40 M}$$

7. How much water needs to be added to a 0.9M H_2SO_4 solution to dilute it to 0.5M?

$$c_1 V_1 = c_2 V_2$$

$$(0.9)(100) = (0.5)(V_2)$$

$$V_2 = 180 mL$$

→ 80mL need to be added.

$$\boxed{0.08 \, L}$$

8. Reach back to last year's lab exam …. How would you prepare 750 mL of a 0.5 M LiOH solution?

$$\frac{0.5 mol}{1 L} = \frac{x}{0.750 L} \qquad x = 0.375 \, mol \, LiOH$$

$$\frac{1 mol}{0.375 mol} = \frac{23.95 g}{x} \qquad x = 8.98 g = 9 g$$

1. Dissolve 9g of LiOH in water in a beaker

2. Pour into a 750mL volumetric flask

3. Rinse beaker + sides of flask

4. Dilute to line

5. Swirl