

## **Concentration test part 2 practice test**

**Answer the next four questions from the following problem.**

A solution is made by dissolving 12.552 grams of potassium permanganate ( $\text{KmnO}_4$ ) in 290 mL of water. What is the molarity of the solution?

1. What are the units that will be given in the answer?

A. grams B. mL of solution C. moles/liter D. moles

2. What is one proportion given in the problem that will be needed to solve it?

A. 12.552 g/1 mole B. 12.552 g/290 mL C. 12.552 g/ 158 g D. 158 g/290 mL

3. How would this problem be set up?

A.  $\frac{12.552 \text{ g}}{290 \text{ mL}} \cdot \frac{158 \text{ g}}{1 \text{ mole}} \cdot \frac{1000 \text{ mL}}{1 \text{ Liter}}$

B.  $\frac{290 \text{ mL}}{12.552 \text{ g}} \cdot \frac{1 \text{ mole}}{158 \text{ g}} \cdot \frac{1000 \text{ mL}}{1 \text{ Liter}}$

C.  $\frac{12.552 \text{ g}}{290 \text{ mL}} \cdot \frac{1 \text{ mole}}{158 \text{ g}} \cdot \frac{1 \text{ Liter}}{1000 \text{ mL}}$

D.  $\frac{12.552 \text{ g}}{290 \text{ mL}} \cdot \frac{1 \text{ mole}}{158 \text{ g}} \cdot \frac{1000 \text{ mL}}{1 \text{ Liter}}$

4. What is the correct answer? –NOTE THAT UNITS ARE NOT GIVEN.

A. .27 C. 2.11 B. 6838 D. .00027

**Complete the following problems, SHOWING ALL OF YOUR WORK!**

Calculate the molar mass of each of the following compounds:

5.  $\text{KClO}_4$

6.  $\text{Al}_2\text{S}_3$

7.  $\text{Mg}(\text{OH})_2$

Calculate the number of grams, or the number of moles, in each of the following:

8. moles in 8 g of  $\text{CaSO}_4$

9. grams in 3 mole of  $\text{CuCl}_2$

10. Calculate the percent concentration (mass/volume) of 154 grams of baking soda dissolved in 1.4 L of water.

11. How many grams of sugar are in 355 mL (12oz.) of a 13.2% (mass/mass) Dr. Pepper? Assume 1 mL of Dr. Pepper has a mass of 1g.

12. The average person has 200 ppm of Carbon monoxide in their blood. If you have 2 Kg of blood in your body, how many mg of Carbon Monoxide do you contain?

13. A solution contains 280 g of salt ( $\text{NaCl}$ ) in water to make 2700 mL of solution. Calculate the molarity of the solution.

14. Solve using a picket fence. How many grams of lithium nitrate ( $\text{LiNO}_3$ ) are needed to make 850 mL of a 1.5 M lithium nitrate solution?
15. A plant has 500 mL of an arsenic solution which contains 1500 ppm. How much water must be mixed with the arsenic solution to dilute it to a concentration of .05 ppm (the EPA standard)?

### Answers to Questions

1. C
2. B
3. D
4. A
5. 138.5 grams/mole
6. 150 grams/mole
7. 58 grams/mole
8. .06 moles
9. 403.5 grams
10. 11 %
11. 46.86 grams
12. 400 ppm
13. 1.8 moles/liter (molarity)
14. 87.9 grams
15. 15 million milliliters or 150,000 liters