Chemistry 20	Unit 3
Lesson 4 - Concentration as Parts Per Million	84 mins

$$C = \frac{quantity\ of\ solute}{quantity\ of\ solution\ (Quantity_{solvent} + Quantity_{solute})}$$

Parts Per Million

% = parts per cent (100) ppm = parts per million (1,000,000)	ppm = $\frac{1}{10^6}$ $C_{ppm} = \frac{m_{solute}}{m_{solution}} \times 10^6$ $C_{ppm} = \frac{V_{solute}}{V_{solution}} \times 10^6$

Examples

$C_{ppm} = \ ??$ $m_{solute} = 0.022\ g$ $m_{solution} = 250\ g$ $ppm = \frac{m_{solute}}{m_{solution}} \times 10^6$ $ppm = \frac{0.022\ g}{250\ g} \times 10^6 = 88\ ppm$	$C_{ppm} = \ 0.0050$ $m_{solute} = \ ???$ $m_{solution} = 500\ g$ $C_{ppm} = \frac{m_{solute}}{m_{solution}} \times 10^6$ $m_{solute} = \frac{(C_{ppm})(m_{solution})}{10^6}$ $m_{solute} = \frac{(0.0050)(500g)}{10^6} = 2.5 \times 10^{-6}\ g\ (unit\ will\ match)$

Chemistry 20 - Unit 2 - Concentration Practice

Name: _____

You may find the following formulas useful:

$C = \frac{n}{V}$	$C_{v/v} = \frac{V_{solute}}{V_{solution}} \times 100\%$
$m = Mn$	$C_{w/w} = \frac{m_{solute}}{m_{solution}} \times 100\%$
$d = \frac{m}{V}$	$C_{ppm} = \frac{m_{solute}}{m_{solution}} \times 10^6$
$C_{ppm} = \frac{V_{solute}}{V_{solution}} \times 10^6$	

1. 15.0 mL of sodium chloride is added to 35.0 mL of water. What is the solution's concentration in parts per million?

2. Mr. Pruden's dog wears a lot of jewelry. Her collar is sterling silver and has a mass of 48.0 grams. If 12.6 grams of silver are present in the collar, what is the silver's percentage concentration by weight?

3. How many liters of 1.50 mol/L solution of magnesium hydroxide would contain 40.0 g of solute?

4. Sodium phosphate solution is used to remove the scales at the bottom of a tea kettle. Calculate the mass of sodium phosphate needed to make 4.00 L of a 0.500 mol/L cleaning solution.

5. Calculate the mass of silver nitrate needed to prepare 1.00 liter of a 0.325 mol/L.

6. Mr. Pruden's dog is frighteningly intelligent and decides to prepare a brine solution for fun. She uses 15.0 grams of sodium chloride to prepare 100 mL of solution.
    a. How many moles of sodium chloride were used?

    b. What is the chemical amount concentration of brine in moles per litre?

7. What is the % (w/w) concentration of 433 ppm by weight of sodium chloride?