**Concentration in Parts per Million**

**PPM** is used for concentration when the amount of solute is very small.

The concentration in ppm is the number of parts of solute in 1 million parts of solution.

**1 ppm = 1 g of solute**

**1 000 000 g of solution**

More importantly! **1 ppm = 1 mg of solute**

**1 L of Solution**

**This is your go to when solving problems!**

e.g. It reads 0.5 ppm You immediately write \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

e.g. It reads 12 ppm You immediately write \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Then use D.A. to get to the units required.

Water in a public swimming pool contains approx. 1 ppm of chlorine to control bacterial growth.

Here’s the bad part! **Treat water like solution in this case!** Goes against everything we’ve said so far but such is life!

So 25 mg of solute in 5 0000 mL of water would be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ppm?

**Problems:**

1) The label on the bottle of water reads 45 ppm of sodium ions.

What does this mean in English?

What is the concentration in g/L? **(0.045 g/1L)**

2) The water in a lake is contaminated. To determine the concentration of the contaminant, the technician takes a 50.0 mL of water. After several tests, he concludes that the sample contains 3.75 mg of contaminant.

Calculate the concentration of the contaminant in ppm.  **(75 ppm)**

3) Certain minerals are essential to good health. For example, a person should take in approx. 350 mg of magnesium ions daily. Magnesium can be found in many foods, such as whole wheat bread, which contains about 850 ppm. Assuming that a slice of whole wheat bread has a mass of about 30.0 g, how many slices would a person have to eat to obtain the recommended daily dose of magnesium ions? **(13.73 slices)**

4) The Safe Drinking Water Act (which President Trump is attempting to destroy) sets a limit for mercury (a toxin to the central nervous system) at 0.0020 ppm by mass. Water suppliers must periodically test their water to ensure that mercury levels do not exceed this limit. Suppose water becomes contaminated with mercury at twice the legal limit.

How much of this water would have to be consumed for someone to ingest 50.0 mg of mercury? **(12 500 L)**

5) What is the concentration in iron ions in ppm if 0.00020 g iron (III) ions are dissolved in 2.5000 kg of water? **(0.08 ppm Fe3+ ions)**

6) Oil is found to have a dioxin contamination of 2.0 ppm.

How many mL of the oil would contain 0.010 g of dioxin? **(5000 mL)**

7) A solution contains Cu2+ ions at a concentration of 0.0190 g/L.

What is the concentration of copper 2+ ions in ppm?? **(19 ppm)**

8) In some creek water, the concentration of lead 2+ ions is 0.050 ppm.

Calculate the mass of lead ions per litre of creek water in mg/L.