Grade 7 Science

Concentrations of Solutions

Concentration is…

- The quantity of solute that is dissolved in a certain quantity of the solvent.
- Can be described qualitatively or quantitatively.

Qualitative

- Using words such as like "dilute" or "concentrated"

Quantitative

- Using numbers. This is especially important when safety is an issue!

Student Activity…

1. Demo of quantitative concentration

2. Demo of qualitative concentration

Student Practice… (page 471) Qualitative or Quantitative?

#1(a). Food coloring made the water blue.

Qualitative

(b). Adding 3 mL of food coloring turned 250 mL of water blue.

Quantitative

#2(a). The water became warmer. Qualitative

(b). The water's temperature increased by 5 degree Celsius. Quantitative

#3(a). We needed just over a dozen floor tiles for our model room.

Qualitative

(b). We needed 14 floor tiles for our model room.

Quantitative

#4(a). The liquid boiled in 5 min. Quantitative

(b). The liquid took only a few minutes to boil. Qualitative

#5(a). The mass of this solid is 5g more than that one.

Quantitative

(b). This solid is heavier than that one.

Qualitative

#6(a). He drinks eight glasses of water each day.

Qualitative

(b). He drinks 2L of water each day.

Quantitative

Dilute vs. Concentrated

Dilute

- There is a small mass of dissolved solute for a certain quantity of solvent.

Concentrated

- There is a large mass of dissolved solute for a certain quantity of solvent

Dilute   Concentrated

Saturated vs. Unsaturated

Saturated

- Will form when no more solute will dissolve at a certain temperature

Unsaturated

- More solute is able to dissolve at a certain temperature

30.0 g NaCl   +   100 mL H₂O   =   **Unsaturated solution** containing 100 mL H_2O and 30.0 g NaCl

40.0 g NaCl   +   100 mL H₂O   =   **Saturated solution** containing 100 mL H_2O and 36.0 g NaCl

The additional 4.0 g NaCl remains undissolved

Question to ponder…

Can a solution be considered to be concentrated be unsaturated? Explain

Quantitative Description

Expressed as the amount of solute per unit volume.

Examples: g/L

g/mL

ppm (parts per million)

%

Converting g/mL to g/L

Remember there are 1000mL in 1 L.

1g/mL = ? g/L

1 x 1000 = 1000
therefore 1000g/L

Practice Problems…

0.3g/mL = ? g/L

300g/L

8.9g/mL = ? g/L

8900g/L