

CHEMISTRY

SOLUTIONS

TYPES OF SOLUTIONS

A solution is a *Homogeneous Mixture*. This means that it has just one phase or "uniform" throughout. Most solutions are a mixture of two substances: The *Solvent* and the *Solute*

SOLVENT:

SOLUTE:

Ex: Salt (a solute) will dissolve in Water (a solvent) to make a solution of saltwater.

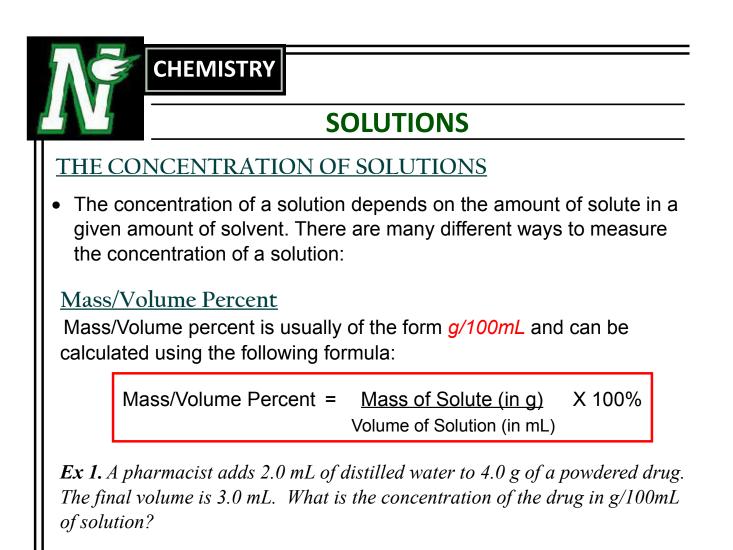
Aqueous Solution: Any solution where water is the solvent.

Solubility and Saturation

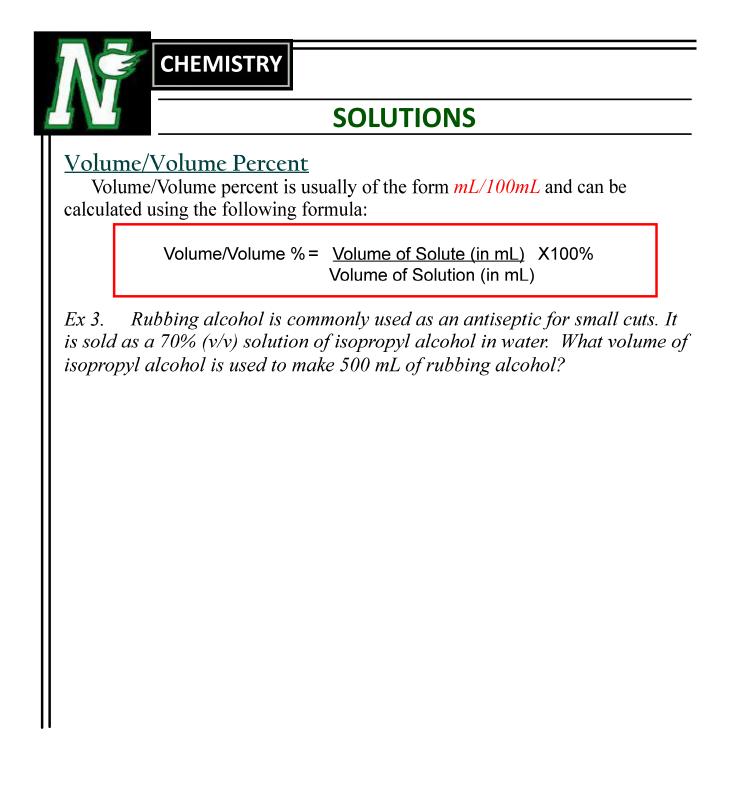
Solubility is the ability of the solvent to dissolve the solute. This is accomplished by way of attractive forces. If the forces of the solvent are stronger than those of the solute, then the solute will dissolve.

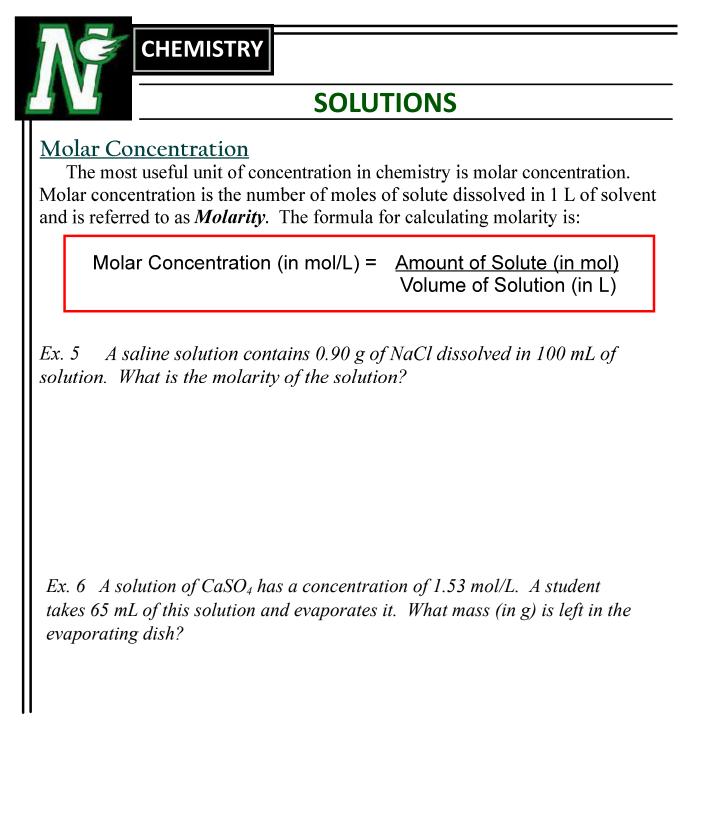
There comes a point however, when the solvent can't dissolve any more solute. At this point, the solution is **SATURATED**.

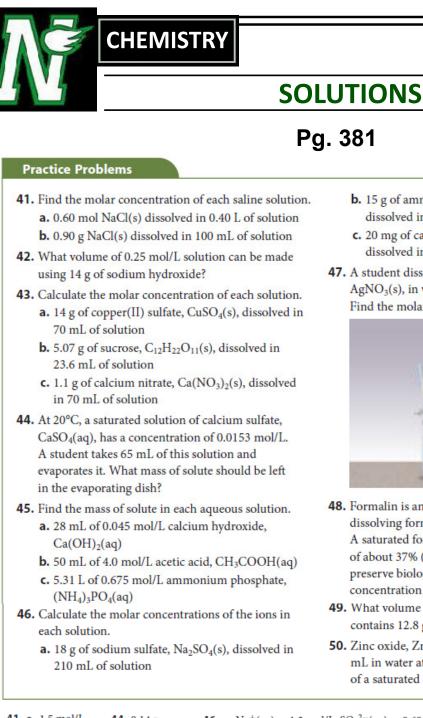
Solubility can be increased by raising the temperature of the solvent and can be decreased by lowering the temperature of the solvent. This implies, that a saturated solution can become unsaturated and dissolve more solute if it is heated (warm water will dissolve more salt than cold water). If the solution is cooled, the opposite happens (unsaturated becomes saturated).



	5			SC	IUTI	ONS			
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the	n boiled to	o remove	e all the wa	ater c	and leav	es a 4.58		0	
	n boiled to	o remove	e all the wa	ater c	and leav	es a 4.58		0	







- b. 15 g of ammonium phosphate, (NH₄)₃PO₄(s), dissolved in 98 mL of solution
- c. 20 mg of calcium phosphate, Ca₃(PO₄)₂(s), dissolved in 1.7 L of solution
- **47.** A student dissolves 28.46 g of silver nitrate, AgNO₃(s), in water to make 580 mL of solution. Find the molar concentration of the solution.



- 48. Formalin is an aqueous solution that is made by dissolving formaldehyde gas, HCHO(g), in water. A saturated formalin solution has a concentration of about 37% (m/v). This concentration is used to preserve biological specimens. Calculate the molar concentration of 37% (m/v) formalin.
- 49. What volume of a 0.555 mol/L aqueous solution contains 12.8 g of sodium carbonate, Na₂CO₃(aq)?
- 50. Zinc oxide, ZnO(s), has a solubility of 0.16 mg/100 mL in water at 30°C. Find the molar concentration of a saturated solution of zinc oxide at 30°C.

 41. a. 1.5 mol/L
 44. 0.14 g
 44. 0.14 g

 b. 0.2 mol/L
 45. a. 0.093 g

 42. 1.4 L
 b. 10 g

 43. a. 1 mol/L
 c. 534 g

- a. 1 mol/L c. 534 b. 0.628 mol/L
- **c.** 0.1 mol/L

46. a. Na⁺(aq) = 1.2 mol/L; SO₄²⁻(aq) = 0.60 mol/L **b.** NH₄⁺(aq) = 3.1 mol/L; PO₄³⁻(aq) = 1.0 mol/L **c.** Ca²⁺(aq) = 1 × 10⁻⁴ mol/L; PO₄³⁻(aq) = 8 × 10⁻⁵ mol/L

- 47. 0.29 mol/L
- 48. 12 mol/L
- **49.** 218 mL
 - **50.** 2.0×10^{-5} mol/L