

SCH 4U

Equilibrium Applications- Solubility Equilibrium

Students will be able to:

Objective 1

- define or explain the meaning of the following: ionic compound, salt, dilute solution, concentrated solution, hydration, solute, solvent, solution, solubility, unsaturated, saturated and supersaturated solutions

Objective 2

- recognize equilibrium involving heterogeneous systems and define or explain the meaning of the following: solubility product, sparingly soluble and solubility equilibrium

Objective 3

- be able to write out the solubility product expression (K_{sp}) given the formula of the solute or the solubility equilibrium

Objective 4

- use ion concentrations to obtain the numerical value of K_{sp}

Objective 5

- develop skill in diluting solutions to specified concentrations and in calculating the concentration of a given volume of solution that has been diluted by adding water or a second solution ($C_cV_c=C_dV_d$)

Objective 6

- develop skill in organizing sample experimental data and use it to determine K_{sp} values

Objective 7

- develop skill in calculating K_{sp} using solubilities (Type A calculations)

Objective 8

- develop skill in determining the concentration of sparingly soluble substances in pure water using their solubility product (K_{sp}) (Type B calculations)

Objective 9

- develop skill in determining the solubility (in mol/L and g/L) of sparingly soluble substances in pure water using their solubility product, K_{sp} (Type B calculations)

Objective 10

- develop skill in using K_{sp} to calculate the concentration or solubility (both in mol/L and g/L) of sparingly soluble substances in solvents containing a dissolved common ion (Type C calculations)

Objective 11

- develop skill in using K_{sp} values and the formation of a precipitate to determine the concentration of ions in solution (Type D calculations)

Objective 12

- use simple qualitative solubility rules (those ions that always dissolve to 0.1 mol/L) to identify salts that are likely to have low solubility (can you read/understand the solubility rules)

Objective 13

- use solubility rules and K_{sp} values to predict the formation of precipitates (Type D calculations)

Objective 14

- use solubility rules and K_{sp} values to determine the mass of a precipitate that forms (Type D calculations)

Objective 15

- given their numerical K_{sp} values, rank the substances' solubilities