

Chemistry 12

Unit III Solubility

Prescribed Learning Outcomes

The following grid contains all the prescribed learning outcomes (2007 / 2008) for the Solubility unit of Chemistry 12. Use this in conjunction with the Solubility Study Guide to determine your level of competence and understanding of each learning outcome. Once you are confident that you completely understand each learning outcome, place a check mark in the square provided.

Please Note: The Chemistry 12 Study Guides are based on the OLD PLO's. Use the "Study Guide Equivalent" column to match up the old PLO's to the new ones.

Prescribed Learning Outcomes	Achievement Indicators	Study Guide Equivalent	Status
C1 determine the solubility of a compound in aqueous solution	Classify a solution as ionic or molecular, given its conductivity or the formula of the solute	G1	<input type="checkbox"/>
	Describe the conditions necessary to form a saturated solution	G2	<input type="checkbox"/>
	Describe solubility as the concentration of a substance in a saturated solution	G3	<input type="checkbox"/>
	Use appropriate units to represent the solubility of substances in aqueous solutions	G4	<input type="checkbox"/>
C2 describe a saturated solution as an equilibrium system	Describe the equilibrium that exists in a saturated aqueous solution	G6	<input type="checkbox"/>
	Describe a saturated solution using a net ionic equation	G7	<input type="checkbox"/>
C3 determine the concentration of ions in a solution	Write dissociation equations	N/A	<input type="checkbox"/>
	Calculate the concentration of the positive and negative ions given the concentration of a solute in an aqueous solution	G8	<input type="checkbox"/>
C4 determine the relative solubility of a substance given solubility tables	Describe a compound as having high or low solubility relative to 0.1 M by using a solubility chart	H1	<input type="checkbox"/>
	Use a solubility chart to predict if a precipitate will form when two solutions are mixed, and identify the precipitate	H2	<input type="checkbox"/>
	Write a formula equation, complete ionic equation, and net ionic equation that represents a precipitation reaction	H3	<input type="checkbox"/>
C5 apply solubility rules to analyse the composition of solutions	Use a solubility chart to predict if ions can be separated from solution through precipitation, and outline an experimental procedure that includes <ul style="list-style-type: none">- Compound added- Precipitate formed- Method of separation	H4	<input type="checkbox"/>
	Predict qualitative changes in the solubility equilibrium upon the addition of a common ion or the removal of an ion	H5	<input type="checkbox"/>
	Identify an unknown ion through experimentation involving a qualitative analysis scheme	H6	<input type="checkbox"/>
	Devise a procedure by which the calcium and / or magnesium ions can be removed from hard water	H7	<input type="checkbox"/>

Prescribed Learning Outcomes	Achievement Indicators	Study Guide Equivalent	Status
C6 formulate equilibrium constant expression for various saturated solutions	Describe the K_{sp} expression as a specialized K_{eq} expression	I1	<input type="checkbox"/>
	Write a K_{sp} expression for a solubility equilibrium	I2	<input type="checkbox"/>
C7 perform calculations involving solubility equilibrium concepts	Calculate the K_{sp} for a compound when given its solubility (e.g. $AgCl$, Ag_2S , $PbCl_2$)	I3	<input type="checkbox"/>
	Calculate the solubility of a compound from its K_{sp}	I4	<input type="checkbox"/>
	Predict the formation of a precipitate by comparing the trial ion product to the K_{sp} value using specific data	I5	<input type="checkbox"/>
	Calculate the maximum allowable concentration of one ion given the K_{sp} and the concentration of the other ion just before precipitation occurs	I6	<input type="checkbox"/>
C8 devise a method for determining the concentration of a specific ion	Determine the concentration of chloride ion (by titration or gravimetric methods) using a precipitation with silver ion	I7	<input type="checkbox"/>

