

ASSIGNMENT: SOLUBILITY GRAPH

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The solubility of solids in liquids is affected by temperature, by solute particle size and by agitation (i.e. shaking or stirring). A solution is said to be saturated if there is as much solute as can possibly be dissolved in a given amount of solvent at a given temperature.

Solubility of gases decreases with temperature but increases with pressure.

1. Using a graph paper, plot the solubility of copper (II) sulphate (y-axis) versus the temperature (x-axis) using the following data, and then answer the questions using the graph:

Solubility (g /100 g water)	Temperature ($^{\circ}\text{C}$)
14.3	0.00
17.4	10.0
20.7	20.0
25.0	30.0
28.5	40.0
33.3	50.0
40.0	60.0
55.0	80.0
75.4	100.0

- What is the solubility of copper (II) sulphate at 55.0°C ?
- If the above solution were cooled to 5.00°C , what would happen ?
- What mass of copper (II) sulphate would precipitate out at 5.00°C ?
- What is the temperature when the solubility of copper (II) sulphate is $25.0\text{ g /100 g water}$?
- Would 35.0 g of copper (II) sulphate dissolve completely at 65.0°C ? If so, what type of solution would be obtained?
- Would 100.0 g of copper (II) sulphate completely dissolve at 95.0°C ? What type of solution would be obtained?
- How many grams of copper (II) sulphate are present in 50.0 g of water at 25.0°C ?
- A solution of copper (II) sulphate in 100 g of water is saturated at 15.0°C . How much additional copper (II) sulphate must be added to saturate the solution at 45.0°C ?
- A saturated solution of copper (II) sulphate is cooled from 65.0°C to 22.0°C . How many grams of copper (II) sulphate will precipitate out of 100.0 g of solution ?
- 50.0 g of copper (II) sulphate are added to 100.0 g of water at 22.0°C .
 - How much will remain as residue?
 - To what temperature must the solution be heated for all the copper (II) sulphate to dissolve?