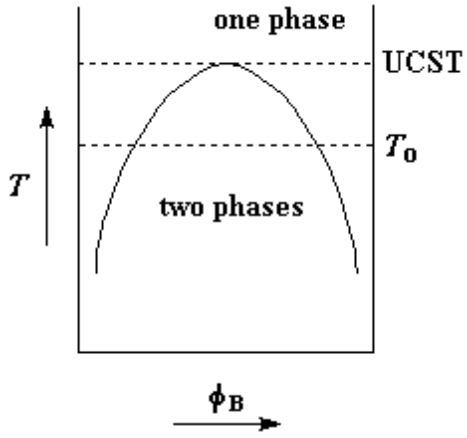
**Engineering Chemistry**

**Assignment 1:**

**Q1. What is Critical Solution Temperature (CST)? Explain the phenol-water system with diagram.**

**Critical Solution Temperature (CST):** The Critical solution temperature (CST) is the temperature above (for upper critical solution temperature) or below (for lower critical solution temperature) which the components of a mixture are miscible in all proportions.

**Phenol-water system:** A few types of liquids are miscible to each other at all measurement, for example: ethanol and water. Other liquids are miscible in other liquids at a limited proportion, for example: ether-water, phenol water.
Phenol water system is a good experiment to describe CST. In many combination and temperature phenol and water are not completely miscible. Sometimes the quantity of phenol in the solution is higher than water and sometime water is higher than phenol. only when the temperature goes above CST phenol and water is completely miscible in any ratio.
Below there is a diagram which explains this concept more accurately.




Here T is represents the change of temperature and B is the various composition of phenol-water.

**Q2. What is solution? Describe types of solutions with examples.**

**Solution:** Solutions are homogeneous mixtures. The major component is called solvent, and the minor components are called solute. If both components in a solution are 50%, the term solute can be assigned to either component.

The types of solutions are:

| Sl.No | Solute | Solvent | Example |
|---|---|---|---|
| 1 | Gas | Liquid | Whipped cream |
| 2 | Liquid | Liquid | Mayonnaise |
| 3 | Liquid | Solid | Gelatin |
| 4 | Solid | Solid | Cranberry glass |
| 5 | Solid | Gas | Smoke |