

Assignment 1

Due: In One Week.

- 1) Two hypothetical metals C and D are dissolved in each other and the following information is available from the experiment:
 - a) The melting temperatures of C and D are 700°C and 900°C , respectively.
 - b) The metals form a eutectic at a composition of 55% D at 400°C .
 - c) The maximum solubility possible at eutectic temperature are found to be 20% of D in C and 25% of C in D .
 - d) At room temperature, maximum solubility of D in C is 5% and C in D is 10% .

Using graph paper, draw the phase diagram to scale, showing the main features. All lines may be assumed to be straight.

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Assignment 1 – Cont'd.

Due: In One Week.

- 2) Describe the changes which occur when the following alloy compositions are allowed to cool slowly from the liquid state to room temperature. Mention the temperatures where any phase changes occur and state the phases.
 - a) 45% *C* / 55% *D*.
 - b) 60% *C* / 40% *D*.

- 3) For 60% *C* / 40% *D*, give the phases present, their relative proportions and their compositions at the *Liquidus*.