Self-Assessment: Solid Solutions

Weekly Homework Quiz

(a) Construct the phase diagram (T,c) for Ag-Cu given the following data. (Assume all phasie lines to be straight.)

T_M Ag: 960°C
T_M Cu: 1080°C
T_E (Eutectic)   780°C: α [9 wt.% Cu]; β [92 wt.% Cu]; Eutectic comp. 28 wt.% Cu
                400°C: α [1 wt.% Cu]; β [100 wt.% Cu]

(b) Determine the liquidus temperature for a 60 wt.%Ag – 40 wt.% Cu alloy.

(c) Determine which other Ag-Cu alloy composition has the same liquidus temperature as the one determined in (b).

(d) 26 g of sterling silver (92.5 wt.% Ag – 7.5 wt.% Cu) are melted together with 376 g of pure copper (Cu). Given the phase diagram for Ag-Cu, determine:
    (a)   the liquidus temperature for the alloy formed;
    (b)   the solidus temperature for this alloy;
    (c)   the composition of the alloy formed.

3.091SC Introduction to Solid State Chemistry

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