

※ 注意：請於試卷上「非選擇題作答區」標明題號並依序作答。

1. Compare and contrast face-centered cubic (FCC) and hexagonal close-packed (HCP) crystal structures. (10%)
2. List and discuss in detail the factors that influence the rate of diffusion. (10%)
3. Figure 1 shows a portion of the nickel-titanium phase diagram. Write down the congruent transformation(s) and the incongruent transformation(s) shown in Figure 1. (10%)

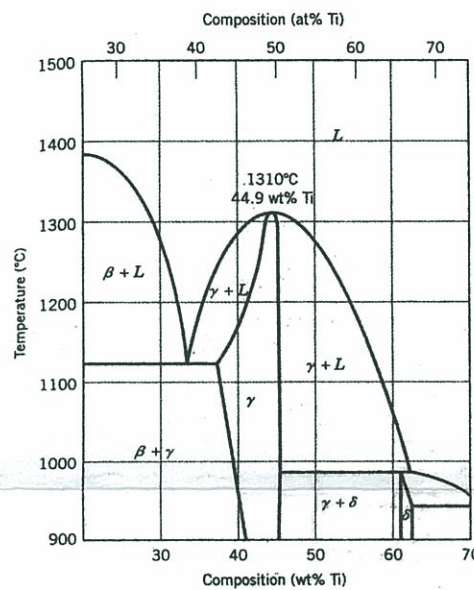


Figure 1

4. In terms of heat treatment and the development of microstructure, what are two major limitations of the iron-iron carbide phase diagram? (10%)
5. Suppose that CaO is added as an impurity to CaCl₂. If the O²⁻ substitutes for Cl⁻, what kind of vacancies would you expect form? How many of these vacancies are created for every O²⁻ added? (10%)
6. From a molecular perspective, briefly explain the mechanism by which clay minerals become hydroplastic when water is added. (10%)
7. The number-average molecular weight of a poly(acrylonitrile-butadiene) alternating copolymer is 1000000 g/mole; determine the average number of acrylonitrile and butadiene repeat units per molecule. (10%)
8. When citing the ductility as percentage elongation for semicrystalline polymers, it is not necessary to specify the specimen gauge length, as in the case with metals. Why is this so? (10%)
9. How does the electron structure of an isolated atom differ from that of a solid materials? (10%)
10. Cite the differences in operation and application for junction transistors and MOSFETs. (10%)

試題隨卷繳回