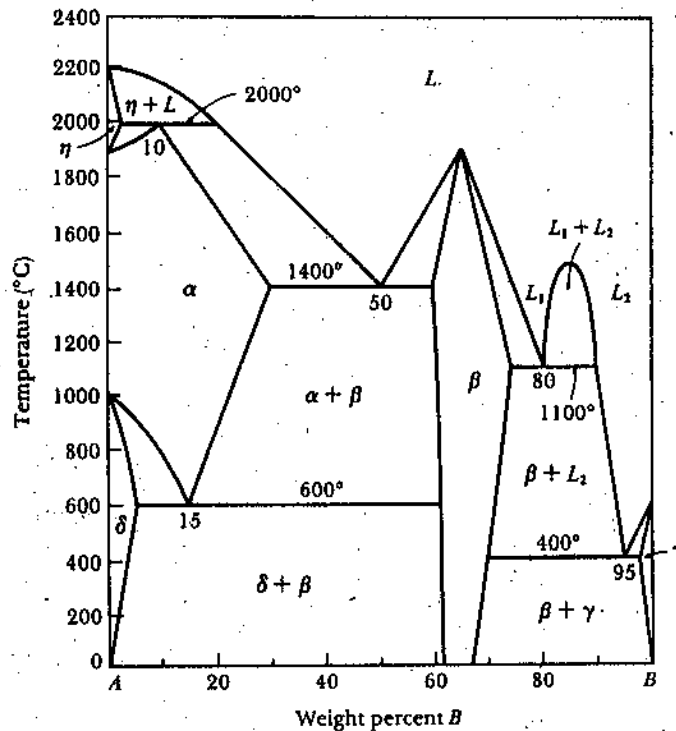


# 國立中央大學九十一學年度碩士班研究生入學試題卷

所別: 光電科學研究所 不分組 科目: 材料工程 共    頁 第    頁

- (20) 1. Suppose a Si wafer 0.1 cm thick, which originally contains one phosphorous atom for every 10,000,000 Si atoms, is treated so that there are 400 phosphorous atoms for every 10,000,000 Si atoms at surface. Calculate the concentration gradient of phosphorous in atoms/cm<sup>3</sup>.cm. The lattice parameter of Si is 5.4307 Å, and the unit cell of Si contains 8 atoms.
- (20) 2. Draw the stress-strain curves to compare the properties between brittle and highly ductile materials.
- (20) 3. Consider the phase diagram as below; please identify the five most important three-phase reactions that occur.



- (20) 4. Explain the effect of temperature on the conductivity of extrinsic semiconductor with a plot.
- (20) 5. Explain the piezoelectric effect and give one example of application.

參考用