

系所別:

光電科學研究所

科目:

材料工程

1. (10%)

若 diffusivity 在 30°C 為 50，而 activation energy 為 0.8 eV，則其在 350°C 時之 diffusivity 為多少?

2. (15%)

解釋 ionic bond、covalent bond 及 metallic bond，並舉例之。

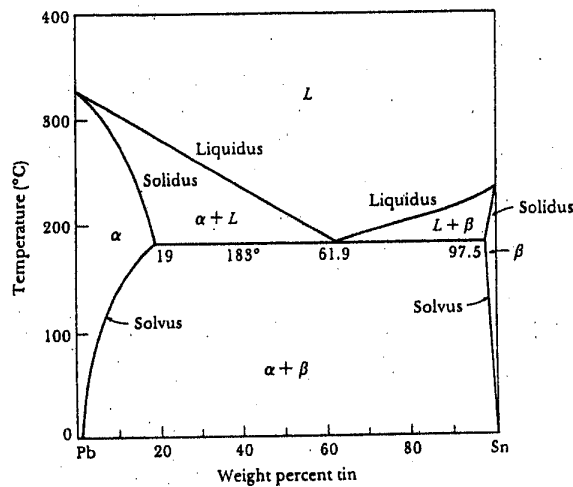
3. (10%)

請劃出 simple cubic、body-centered cubic 及 face-centered cubic 的圖形，並解釋之。

4. (15%)

Extrinsic semiconductor 之 conductivity 與溫度關係為何?請作圖，並且標出各階段的 control factor 及其斜率。

- (20) 5. From the lead-tin equilibrium phase diagram as follows, the eutectic alloy at 183°C containing 61.9% tin. Please draw the profiles to show the amount and the composition of each phase ( $\alpha$ - and  $\beta$ -phase) versus temperature while the alloy is cooled from 183°C to 25°C.



參考用

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- (15) 6. Please explain and compare the following microstructures of material:

(a) amorphous, (b) random orientation, (c) preferred orientation, (d) predominant orientation.

- (15) 7. Please show the mechanical characteristics of the brittle, strong and tough materials by drawing the stress-strain curves.