

95 年度轉學考材料科學試題

1. (a) What is model for the Bohr atom? (b) Is the model correct? What is the problem of the model? (c) Compare Bohr with wave-mechanical atom model. 10 %
2. Show that the atomic packing factor for the face-centered cubic (FCC) crystal is 0.74. 10%
3. Describe the difference between edge dislocation and screw dislocation. 10%
4. The diffusion coefficients for carbon in nickel are given at two temperatures

T (°C)	D (m ² /s)
600	5.5×10^{-14}
700	3.9×10^{-13}

 - (a) Determine the values of D_0 and the activation energy Q_d .
 - (b) What is the magnitude of D at 850°C?
(Gas constant R is 8.31J/mol-K) 10 %
5. Describe the difference between ductile and brittle materials by the plot of tensile stress-versus strain. 10%
6. Describe the difference between thermal setting polymers and thermal plastic polymers and give an example for each kind of them. 10%
7. Describe the difference between eutectic reaction and eutectoid reaction and give an example for each kind of them. 10%
8. Describe the difference between intrinsic semiconductor and extrinsic semiconductors and give an example for each kind of them. 10%
9. Describe the difference between hard magnetic material and soft magnetic material and give an example for each kind of them. 10%
10. Briefly explain why some transparent materials appear colored while others are colorless. 10%