**動機系材導第一次習題**

**106年3月13日繳交**

1.28 a) Name the important criteria in selecting materials for a protective sports helmet. b) Identify materials that would satisfy the above criteria. c) Why would a solid metal helmet not be a good choice?

1.29 Why is it important or helpful to classify materials into different groups as we have done in this chapter?

2.75 The melting point of the metal potassium is 63.5°C, while that of titanium is 1660°C. What explanation can be given for this great difference in melting temperatures?

2.77 After ionization, why is the sodium ion smaller than the sodium atom? After ionization, why is the chloride ion larger than the chlorine atom?

2.81 Silicon is extensively used in the manufacturing of integrated circuit devices such as transistors and light emitting diodes. It is often necessary to develop a thin oxide layer (SiO2) on silicon wafers. a) What are the differences in properties between the silicon substrate and the oxide layer? b) Design a process that produces the oxide layer on a silicon wafer. c) Design a process that forms the oxide layer only in certain desired areas.

2.85 Methane (CH4) has a much lower boiling temperature than does water (H2O). Explain why this is true in terms of the bonding between molecules in each of these two substances.

2.90 A certain application requires a material that is lightweight, an electrical insulator, and has some flexibility. a) Which class of materials would you search for this selection? b) Explain your answer from a bonding point of view.