

# 淡江大學 100 學年度碩士班招生考試試題

58

系別：化學工程與材料工程學系 科目：材 料 科 學

考試日期：2月28日(星期一) 第2節

本試題共 8 大題，共 1 頁

1. Please cite the main differences between ionic, covalent and metallic bonding. (10 pts)
2. How does the electron structure of an isolated atom differ from that of a solid material? (10 pts)
3. Will Cadmium act as a donor or an acceptor when added to a GaAs semiconducting material? Assume that the impurity elements are substitutional. (10 pts)
4. Please explain why porosity decreases the thermal conductivity of ceramic and polymeric materials, rendering them more thermally insulative. (10 pts)
5. Please explain the two sources of magnetic moments for electrons in an atom. Does each electron have a net magnetic moment? Why or why not?(15 pts)
6. Please describe the phenomenon of electronic polarization by electromagnetic radiation. What are two consequences of electronic polarization in transparent materials? (20 pts)
7. Please explain why amorphous polymers are transparent, while predominantly crystalline polymers appear opaque or, at best, translucent. (15 pts)
8. Please explain why the tendency of a polymer to crystallize decreases with increasing molecular weight. (10 pts)