

國立台灣科技大學九十六學年度碩博士在職專班招生試題

系所組別：材料科技研究所碩士在職專班、高職教師組

科目：材料科技實務

共 6 大題，總分 100 分；請於答案卷內依序作答。

1. Explain the following terms: (15 %)
(a) IC, (b) MOS, (c) SEM, (d) CVD and (e) electronic packaging.
2. 將下列文字翻譯成中文：(20%)
Because lead (Pb) is harmful to the environment and human health, the European Union (EU) has promulgated directives, such as WEEE and RoHS, on July 1, 2006 to restrict the use of Pb in electronic products. Thus, there is an urgent demand for lead-free solders in the electronic industry. Due to its relatively low liquidus temperature (193°C), a Sn-9Zn alloy is among the most suitable candidates as lead-free solders for replacing the traditional eutectic Sn-37Pb solder. A substrate material silver for its superior properties, such as conductivity, anti-oxidation and better wettability has been widely used. Meanwhile, the addition of Cu to Sn-Zn solder can also improve solder wettability.
3. The color of the heating coil in a toaster dies off slowly when the toaster is unplugged. However, the color of the light-emitting diode in a clock dies off quickly when the clock is unplugged. Comment on the source(s) of the difference. (10%)
4. Derive the lever rule, which states the relation between the weight fractions of two phases and the overall composition in a binary system. (15%)
5. Glass can be strengthened by dispersing small crystallites inside to form glass ceramics. Why? (10%)
6. Define the following terms: (5% each term, 30% in total)
(a) Creep (b) Stress relaxation (c) Dielectric constant (d) Birefringence
(e) Screw dislocation (f) Atomic packing factor.