

元智大學 九十七 學年度研究所 碩士班 招生試題卷

系(所)別： 先進能源研究所  
碩士班

組別： 能源材料組

科目： 材料科學

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●不可使用電子計算機

1. Draw the following planes in a cubic unit cell; mark the intersections of the planes and the three axes: (a)  $(2\bar{1}1)$  (5%), (b)  $(10\bar{1})$  (5%)
2. What is the difference between the states of phase equilibrium and metastability? (10%)
3. Define engineering strain and true strain and derive their relationship between true strain and engineering strain? (10%)
4. List three strengthening methods for single-phase metals, and explain how they work. (15%)
5. Sketch and explain Hysteresis effect (Label remanence & coercivity in diagram)? (10%)
6. Why a proeutectoid phase (ferrite or cementite) forms along austenite grain boundaries? (10%)
7. Write down Fick's 2nd law and explain its physical meaning? (10%)
8. Differentiate between polymorphism and isomerism. (10%)
9. Draw a typical tensile stress-strain curve for crystalline metals (5%). List all the materials properties you can obtain from the curve, and mark them on the curve you draw. In addition, explain the physical meaning of the above items. (10%)

(命題請用黑色鋼筆、原子筆繕寫或電腦打字；試題字體務求清晰，並一律以正面單頁書寫，背面請勿書寫。)