

國立臺北科技大學  
九十九學年度研究所碩士在職專班入學考試

有機高分子研究所

乙組：高分子概論（含高分子加工）試題

填准考證號碼

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**注意事項：**

1. 本試題共【5】題，配分共 100 分。
2. 請按順序標明題號作答，不必抄題。
3. 全部答案均須答在試卷答案欄內，否則不予計分。

1. Explain following term: 【40%】
  - A. Impact-resist plastic (give an example)
  - B. Mark-Houwink relation
  - C. Free radical polymerization (give an example of Polyethylene using Benzoyl peroxide as initiator)
  - D. WLF equation
  - E. Power law fluid (give an example for pure polymer)
2.
  - A. Give definition of number-average and weight-average molecular weight.
  - B. Give definition of polydispersity index (PDI), describe the meaning of PDI value.
  - C. What's PDI value for a random molecular weight distribution?

【19%】

3.
  - A. Compare structure of low-density PE (LDPE) and high-density PE (HDPE).
  - B. Dose LDPE or HDPE have better property for application of film? Explain why.

【15%】

4. What is the definition of Poisson's ratio? What is the typical value of Poisson's ratio for elatomers and plastics? 【12%】

5. A stress of 1000 psi is applied to an elastomer at 27°C, and after 25 days the stress is reduced to 750 by stress relaxation. When the temperature is raised to 50°C, the stress is reduced from 1100 to 400 psi in 30 days. Calculate the activation energy for this relaxation process using an Arrhenius-type rate equation. 【14%】