

慈濟大學 97 學年度
研究所碩士班招生考試命題紙

科目：生物化學

共 2 頁

1. Among the 20 amino acids normally found in proteins, there are two of them containing **negatively charged R (functional) groups** at **pH7**. Please give the **full names, three letter abbreviations, and one letter symbols** of these amino acids. (3 分)
2. Please define the **isoelectric point (IP)** of a protein. (2 分)
3. Please define the **“primary structure”** and the **“secondary structure”** of a protein. (4 分)
4. Please indicate the major **non-covalent interactions (forces)** responsible for the folding of proteins in solutions. (8 分)
5. Please give **two examples** (技術的名稱) to the **techniques** which can be applied to **resolve protein structures**. (2 分)
6. An enzymatic reaction was found to be affected by “inhibitor A”, the following data were collected at fixed total enzyme concentration:

[S] (mM)	v_0 ($\mu\text{M}/\text{min}$) (original, uninhibited)	v_0 ($\mu\text{M}/\text{min}$) (inhibitor added)
2.5	28.0	21.0
4.0	40.0	30.0
10.0	70.0	52.5
20.0	95.0	71.3
40.0	112.0	84.0
100.0	128.0	96.0
1000.0	139.0	104.5
2000.0	140.0	105.0

* [S]: substrate concentration; v_0 : initial rate of enzyme catalytic reaction.

* original: enzyme reaction free of inhibitor.

* inhibitor added: enzyme reaction with 1mM “inhibitor A” added.

- (a) Please plot the **Michaelis-Menton** curves of these two experiments (original and inhibited, two curves in one same graph). (4 分)
- (b) What were the V_{\max} and K_M for the enzyme **without** inhibitor added in (original)? (4 分)
- (c) What were the V_{\max} and K_M for the enzyme **with** inhibitor added in? (4 分)
- (d) **What kind of inhibition** did the “inhibitor A” perform? (2 分)

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