

國立臺灣師範大學 100 學年度碩士班招生考試試題

科目：分析化學

適用系所：化學系

注意：1.本試題共 2 頁，請依序在答案卷上作答，並標明題號，不必抄題。2.答案必須寫在指定作答區內，否則不予計分。

1. Identify the compound from the mass spectrum. Explain and rationalize your answer. (15points)

<u>Mass/Charge (m/e)</u>	<u>Relative Abundance</u>
24	1.3
25	5.7
26	22
27	77
28	1.5
29	0.02
30	0.12
30.5	0.24
31	0.16
31.5	0.09
32	0.06
35	2.2
36	1.0
37	0.8
38	0.34
47	2.5
48	1.2
49	0.92
50	0.37
59	1.5
60	5.8
61	8.7
62	100
63	4.8
64	31
65	0.71

2. What are the processes that may occur in the flame of an atomic absorption spectrometer (AA)? Based on them, propose techniques that may increase the sensitivity of AA determinations. (20 points)
3. (a) Define infrared radiation based on its characteristics and wavelength. (5 points)
(b) Give the minimum size of a grating that is able to resolve 254 nm and 255 nm. What are advantages of a grating over prisms as the light dispersive device? (5 points)

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4. Describe the technique APCI in HPLC-MS with needed figure. What are the advantages and limitations of it?(15 points)
5. Describe the functions of intermediate argon flow and outer argon flow in ICP-OES. Give approximate flow rate ranges of these two important flows when operating an ICP-OES. (20 points)
6. (a) Give the complete English names of the following elements: 鋁, 鎳, 鈦, 鈹, 鈾, 鎳, 鈷, 銻, 銻, 銻. (10 points).
(b) Give the complete English names of the following items: 滴定管, 氣相層析儀, 冷凝管, 稱量瓶, 移液管, 量筒, 氣體鋼瓶, 溫度計, 電子天平, 光譜儀. (10 points).