

國立中山大學 96 學年度碩士班招生考試試題

科目：普通化學【海地化所碩士班甲組；乙組選考】

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1. Give the atomic symbol or molecular formula for each of the following elements or compounds: (20%)

- (1) lead (2) tungsten (3) tin (4) silver (5) iron (6) carbon monoxide
(7) nitrous oxide (8) hydrogen sulfide (9) calcium sulfate
(10) potassium bromide

2. Explain the following terms: (30%)

- (1) Avogadro's law (2) pH (3) molality and molarity
(4) atomic mass unit (amu) (5) stoichiometry
(6) catalyst (7) radioactivity (8) stable isotopes
(9) nuclear chain reaction (10) specific heat

Note: you should not just translate them to Chinese

3. What laws are involved in the following expression: (15%)

$$\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2} = nR$$

where P denotes pressure, V is volume, T is absolute temperature, n is number of mole for any ideal gas, and R is the molar gas constant.

4. What are the Group II A elements in the periodic table generally called? What elements are in this group and what are their general characteristics? (15%)

5. Nitric oxide can be produced by copper oxide (Cu_2O) reacting with nitric acid. Express the chemical reaction with balanced equation. How much nitric oxide in liters at STP is produced if 1 mole of (Cu_2O) is reacted with sufficient nitric acid? (20%)

Hint: the products of the reaction also include copper nitrate and water.

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科目：分析化學【海地化所碩士班甲組】

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- 10% (1) 何謂介質效應(matrix effect)? 分析樣品時要如何避免或修正?
- 20% (2) 精確度、準確度有何差別? 如何提高準確度?
- 20% (3) 相同的一塊鐵, 於高雄稱重與於玉山稱重, 重量會有何差異, 詳述理由。
- 20% (4) 簡述 GC 及 AA 之原理。
- 20% (5) 詳述為何不應使用 ppm 作為單位。
- 10% (6) 試述如何製造、保存純水。

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科目：普通地質學【海地化所碩士班乙組選考】

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- 一、試述「板塊構造」(plate tectonics) 學說之源起及發展過程，并以現今海底地形特徵說明之。(30%)
- 二、試說明太平洋和大西洋海底沉積物之異同及其原因。(20%)
- 三、試說明如何利用不同地球物理探測方法來研究地質問題。(15%)
- 四、試舉至少三例說明如何利用地球化學方法來研究地質相關問題。(15%)
- 五、試說明「全球暖化及氣候變遷」之內涵。(20%)

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科目：海洋學概論【海地化所碩士班乙組選考】

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海洋學概論 (海地化所乙組)

1. Please write short answers and draw diagrams if you can, to explain the following terminologies: (50%)
 - (1). primary productivity
 - (2). Ekman spiral
 - (3). continental drift
 - (4). subduction zone
 - (5). upwelling
 - (6). mid-ocean ridge
 - (7). storm surge
 - (8). internal tide
 - (9). turbidite
 - (10). compensation depth
2. Please describe ocean currents around Taiwan. Please draw a diagram to explain your answers. (10%)
3. If we want to use satellites to study the primary production in the ocean, what parameters should the satellites measure? Do we also need to use research ships in the study? If we need to use ships, what should the ships be measuring and for what purposes? (15%)
4. What is the greenhouse effect, and how does it affect the global environment, and particularly, how does it affect oceans and coastal seas? (10%)
5. What are the sources, types, and distributions of sea floor sediments in the global ocean? (5%)
6. How can earthquakes affect the ocean and the sea floor? (10%)

國立中山大學 96 學年度碩士班招生考試試題

科目：構造地質學【海地化所碩士班乙組選考】

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1. 請比較說明發生於 1999 年 9 月 21 日的集集地震、2004 年 12 月 26 日的蘇門答臘地震(Sumatra. Earthquake)和 2006 年 12 月 26 日恆春地震的三者地質背景的異同。(30%)
 2. 在野外進行地質調查時、如何劃分岩層及描述所觀察的變形與構造？(20%)
 3. 請以大地應力狀態說明斷層的種類、以及如何定義活斷層？(20%)
 4. 解釋名詞、必要時請以繪圖方式進一步說明。(30%)
 - 甲、不整合 (unconformity)
 - 乙、背斜褶皺 (anticline)
 - 丙、弧陸碰撞 (arc-continent collision)
 - 丁、混同層 (me`lange)
 - 戊、軟流圈 (Asthenosphere)
 - 己、氣體水合物 (Gas Hydrate)