

# 銘傳大學 102 學年度轉學生招生考試

生物科系學系

二年級第二節

「普通化學」試題

(第 / 頁共 2 頁) (限用答案本作答)

可使用計算機  不可使用計算機

元素原子量如下 Ag: 107.87, Na: 22.99, Zn: 65.39, N: 14.01, O: 16.00, S: 32.07

## A、配合題 (請從表格中找出正確答案)(20%)

1. carbon monoxide
2. sulfur hexafluoride
3. dinitrogen oxide
4. methane
5. ethanol
6. sodium hydrogen carbonate
7. ammonium sulfate
8. sodium chloride
9. magnesium oxide
10. calcium nitrate

a	SF <sub>6</sub>	j	H <sub>2</sub> CO <sub>3</sub>	s	C <sub>2</sub> H <sub>4</sub>
b	HCl	k	SO <sub>2</sub>	t	HBr
c	NaOH	l	C <sub>2</sub> H <sub>5</sub> OH	u	HClO <sub>3</sub>
d	NH <sub>4</sub> SO <sub>4</sub>	m	N <sub>2</sub> O	v	(NH <sub>4</sub> ) <sub>2</sub> S
e	ZnI	n	MgO	w	(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>
f	CO	o	NaCl	x	H <sub>2</sub> SO <sub>4</sub>
g	Ca(NO <sub>3</sub> ) <sub>2</sub>	p	CO <sub>2</sub>	y	NaHCO <sub>3</sub>
h	HCO <sub>3</sub>	q	ZnCl <sub>2</sub>	z	KOH
i	CH <sub>4</sub>	r	C <sub>2</sub> H <sub>6</sub>		

## B、非選擇題 (80%)

1. (a) Calculate the density of mercury if 100 g occupies a volume of 7.36 cm<sup>3</sup>.  
 (b) Calculate the volume of 65.0 g of liquid methanol (wood alcohol) if its density is 0.791 g/ml.  
 (c) What is the mass in grams of a cube of gold (density = 19.32 g/cm<sup>3</sup>) if the length of the cube is 2.00 cm? (6%)
2. Naturally occurring magnesium contains three isotopes: <sup>24</sup>Mg(78.70%), <sup>25</sup>Mg(10.13%), and <sup>26</sup>Mg(11.17%). Estimate the atomic weight of Mg. (6%)
3. Explain the following terms : (18%)
  - a. Le Chatelier's principle
  - b. Free energy
  - c. Conjugate Acids and Bases
  - d. Hydrogen bond
  - e. Free radical
  - f. Resonance structures

本試題係兩面印刷  
Exam Printed on 2 sides.

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二年級第二節

「普通化學」試題

(第 7 頁共 7 頁) (限用答案本作答)

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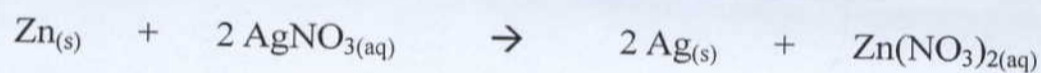
4. How many milliliters of 3.0 M  $\text{H}_2\text{SO}_4$  are needed to make 450 ml of 0.10 M  $\text{H}_2\text{SO}_4$ ? (6%)

5. Given the thermochemical equation



Write a thermochemical equation for

- Formation of 1 mol of  $\text{NH}_3$
  - Decomposition of 4 mol of  $\text{NH}_3$
  - Combination of 1 mol of  $\text{H}_2$  with a stoichiometric quantity of nitrogen (6%)
6. Calculate the molarity of a solution made by dissolving 23.4 g of sodium sulfate ( $\text{Na}_2\text{SO}_4$ ) in enough water to form 125 ml of solution. (6%)
7. When a 2.00 g strip of zinc metal is placed in an aqueous solution containing 2.50 g of silver nitrate, the reaction is



- (a) Which reactant is limiting? (b) How many grams of Ag form? (c) How many grams of  $\text{Zn}(\text{NO}_3)_2$  form? (d) How many grams of the excess reactant are left at the end of the reaction? (12%)

8. Balance the following equations: (20%)

- $\text{Fe}(\text{s}) + \text{Cl}_2(\text{g}) \rightarrow \text{FeCl}_3(\text{s})$
- $\text{SiO}_2(\text{s}) + \text{C}(\text{s}) \rightarrow \text{Si}(\text{s}) + \text{CO}(\text{g})$
- $\text{Fe}(\text{s}) + \text{H}_2\text{O}(\text{g}) \rightarrow \text{Fe}_3\text{O}_4(\text{s}) + \text{H}_2(\text{g})$
- $\text{MgO}(\text{s}) + \text{Fe}(\text{s}) \rightarrow \text{Fe}_2\text{O}_3(\text{s}) + \text{Mg}(\text{s})$
- $\text{H}_3\text{BO}_3(\text{s}) \rightarrow \text{B}_2\text{O}_3(\text{s}) + \text{H}_2\text{O}(\text{l})$
- $\text{NaNO}_3(\text{s}) + \text{H}_2\text{SO}_4(\text{aq}) \rightarrow \text{Na}_2\text{SO}_4(\text{aq}) + \text{HNO}_3(\text{g})$
- $\text{Mg}(\text{s}) + \text{HNO}_3(\text{aq}) \rightarrow \text{H}_2(\text{g}) + \text{Mg}(\text{NO}_3)_2(\text{aq})$
- $\text{Al}(\text{s}) + \text{Fe}_2\text{O}_3(\text{s}) \rightarrow \text{Al}_2\text{O}_3(\text{s}) + \text{Fe}(\text{s})$
- $\text{S}(\text{s}) + \text{O}_2(\text{g}) \rightarrow \text{SO}_3(\text{s})$
- $\text{SO}_3(\text{s}) + \text{H}_2\text{O}(\text{l}) \rightarrow \text{H}_2\text{SO}_4(\text{aq})$

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試題完  
End of exam