

大葉大學九十學年度轉學招生考試試題紙

系 別	日\ 第二部	年級	考 試 科 目 (中 文 名 稱)	考試日期	節次	備註
環境工程學系	日	二	普通化學	七月 二十四日	三	P2-1

註：考生可否攜帶計算機或其他資料作答，請在備註欄註明（如未註明，一律不准攜帶）

1. Indicate the number of protons(質子), neutrons(中子), and electrons(電子) in each of the following species: ${}^4_2\text{He}$, ${}^{79}_{35}\text{Br}$. (8 points)

2. How many atoms (原子) are present in 6.28 g of copper?
(Cu atomic weight 63.546, Avogadro's number 6.022×10^{23}) (8 points)

3. Balance(平衡) the following equations: (8 points)
 - (a) $\text{Cu} + \text{HNO}_3 \rightarrow \text{Cu}(\text{NO}_3)_2 + \text{NO} + \text{H}_2\text{O}$
 - (b) $\text{NH}_3 + \text{CuO} \rightarrow \text{Cu} + \text{N}_2 + \text{H}_2\text{O}$

4. Arrange the following species in order of increasing oxidation number(氧化數) of the sulfur atom: (a) H_2S , (b) S_8 , (c) H_2SO_4 , (d) HS^- , (e) SO_2 . (8 points)

5. A certain first-order reaction(一階反應) $\text{A} \rightarrow \text{B}$ is 75% complete in 42 min at 25°C . What is the half-life of the reaction? (8 points)

6. How many grams of each reactant (反應物) are necessary to produce 400.0 grams of hydrogen sulfate (H_2SO_4) in this reaction? (S atomic weight: 32.06, O atomic weight: 16.000, H atomic weight: 1.008) (8 points)

$$2 \text{SO}_2 + \text{O}_2 + 2 \text{H}_2\text{O} \rightarrow 2 \text{H}_2\text{SO}_4$$

7. 25.0 mL of a 0.175 M solution of KOH is diluted with pure water to a final volume of 750.0 mL. What is the final molarity (M) of the KOH solution? (8 points)

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8. How many moles of argon(Ar) gas are contained in 10.0 L at 0°C and 1.0 atm?
(Ar atomic weight 39.948, gas constant $R = 0.082 \text{ L atm K}^{-1} \text{ mol}^{-1}$) (8 points)

9. Find the standard enthalpy of formation of ethylene, $\text{C}_2\text{H}_4(\text{g})$, given the following data: (8 points)



10. Given that:



Determine the heat of formation for SO_2 . (8 points)

11. Calculate the density of N_2O gas in grams per liter at 100°C and 15 atm.
(N atomic weight 14.007, O atomic weight 16.000) (10 points)

12. How many moles of MgCl_2 are present in 50.0 mL of 0.100M MgCl_2 solution.
(Mg atomic weight 24.305, Cl atomic weight 35.453) (10 points)