

國立成功大學

112學年度碩士班招生考試試題

編 號：145

系 所：環境工程學系

科 目：普通化學

日 期：0206

節 次：第 1 節

備 註：不可使用計算機

※ 考生請注意：本試題不可使用計算機。 請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

- (1) Please write the reaction for the complete combustion of methanol.
(2) Why it is necessary to define the standard state.
(3) What is the enthalpy for the combustion of methanol? (20%)
- (1) Water condenses to ice at 4°C 1 atm and the density decreases during the condensation. What property makes contribution to such a phenomenon.
(2) What happens to boiling point of water when salt is added? Please explain this phenomenon in terms of free energy. (20%)
- For the reaction $A + 2B \rightleftharpoons 3C + D$ the following initial rates of reaction were found in the following table. What is the rate law and the rate constant for this reaction?

[A]/mol dm ⁻³	[B]/mol dm ⁻³	Rate/mol dm ⁻³ s ⁻¹
3.5×10^{-2}	2.3×10^{-2}	5.0×10^{-7}
7.0×10^{-2}	4.6×10^{-2}	2.0×10^{-6}
7.0×10^{-2}	9.2×10^{-2}	4.0×10^{-6}

(20%)

- Phthalic acid is an aromatic dicarboxylic acid with the molecular formula $C_6H_4(CO_2H)_2$. Please draw the chemical structures of this compound and its two isomers. Among the three compounds, which one may exhibit higher solubility in water? Why? (20%)
- How does Le Chatelier's principle explain shifts of a reaction in equilibrium? Please give an example to illustrate. (20%)