

淡江大學 105 學年度碩士班招生考試試題

系列：化學學系

科目：普通化學

18-1

考試日期：3月5日(星期六) 第2節

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- Name the following compounds. (20 pts)
(a) LiCl (b) CsF (c) K_2CO_3 (d) NaOH (e) N_2
- Draw the Lewis structures of the following compounds. (20 pts)
(a) NH_3 (b) I_3^- (c) CF_4 (d) XeO_3 (e) SO_4^{2-}
- Draw the molecular orbital (M.O.) energy level diagram of the following diatomic compounds in ground state. (10 pts)
(a) N_2 (b) F_2
- Calculate the enthalpy (ΔH) for the reaction $N_{2(g)} + 2O_{2(g)} \rightarrow 2NO_{2(g)}$ by using the following two reactions: (10 pts)
$$\begin{array}{l} N_{2(g)} + O_{2(g)} \longrightarrow 2NO_{(g)} \quad \Delta H = 180 \text{ kJ} \\ 2NO_{(g)} + O_{2(g)} \longrightarrow 2NO_{2(g)} \quad \Delta H = -120 \text{ kJ} \end{array}$$
- Write the electron configuration of the following compounds (20 pts)
(1) K (2) Ne (3) Ti (4) Zn (5) S
- HCN is a very weak acid ($K_a = 6.2 \times 10^{-10}$) when dissolved in water. If a 50 mL sample of 0.1 M HCN is titrated with 0.1 M NaOH, calculate the pH of the solution. (20 pts)
(a) After 8.0 mL of 0.1 M NaOH has been added.
(b) At the equivalence point of the titration.