

1. 由96%比重為1.84之 $\text{H}_2\text{SO}_4$ 如何配製2N標準酸溶液1L? (S=32, O=16, H=1)  
(15%)
2. What shape do you expect for each of the following molecules or ions?  
(畫出下列分子形狀並說明其結構) (每小題5%, 共20%)
- (1)  $\text{XeO}_2\text{F}_2$
  - (2)  $\text{H}_3\text{BO}_3$
  - (3)  $\text{H}_2\text{CO}_3$
  - (4) 丙酮
3. Explain the following terms: (舉例說明下列名詞) (每小題5%, 共25%)
- 甲、osmotic pressure 或 osmosis  
乙、green house effect  
丙、London dispersion force  
丁、amino acid  
戊、isomer
4. 由分子軌域(MO)理論判斷NO分子的鍵數(bond order)與順磁性或逆磁性。  
(10%)
5. Balance the equations for the following reactions: (每小題10%, 共20%)  
(平衡方程式)
- (a)  $\text{Cr}(\text{OH})_3(\text{s}) + \text{ClO}^-(\text{aq}) \rightarrow \text{CrO}_4^{2-}(\text{aq}) + \text{Cl}_2(\text{g}) + \text{OH}^-(\text{aq}) + \text{H}_2\text{O}(\text{l})$
- (b)  $\text{PbO}_2(\text{s}) + \text{Pb}(\text{s}) + \text{HSO}_4^-(\text{aq}) + \text{H}^+(\text{aq}) \rightarrow \text{PbSO}_4(\text{s}) + \text{H}_2\text{O}(\text{l})$
6. Write the electron configuration for :  
(寫出原子的電子組態) (每小題5%, 共10%)
- (1) Cr
  - (2) Br