

# 淡江大學 100 學年度碩士班招生考試試題

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系別：化學學系(生物組)

科目：普通化學

考試日期：2月28日(星期一) 第4節

本試題共 10 大題， 1 頁

- Briefly describe Avogadro's hypothesis and Dalton's atomic theory.
- Describe the Bohr model of the atom.
- Describe the Heisenberg uncertainty principle and de Broglie's hypothesis.
- Name the followings: a.  $\text{Na}_2\text{SO}_4$ , b.  $\text{HClO}_4$ , c.  $\text{N}_2\text{O}_3$ , d.  $\text{C}_6\text{H}_6$ , e.  $\text{CH}_4$ .
- How many protons, neutrons and electrons are in followings: a.  ${}^{24}_{12}\text{Mg}^{2+}$ , b.  ${}^{59}_{27}\text{Co}$ , c.  ${}^{79}_{34}\text{Se}^{2-}$ , d.  ${}^{63}_{28}\text{Ni}$ , e.  ${}^{59}_{28}\text{Ni}^{2+}$ .
- Draw the structural formula for the followings:
  - methyl benzoate
  - 4-heptanone
  - Formaldehyde
  - 2-butanol
  - 5,5-dimethyl-2-hexanone
- A certain first reaction has a half-life of 20 minutes.
  - Calculate the rate constant for this reaction.
  - How much time is required for this reaction to be 75% complete?
- What volume (in L) of 0.150 M KCl solution is required to completely react with 0.150 L of a 0.175 M  $\text{Pb}(\text{NO}_3)_2$  solution according to the following balanced chemical equation?
$$2\text{KCl}_{(\text{aq})} + \text{Pb}(\text{NO}_3)_{2(\text{aq})} \rightarrow \text{PbCl}_{2(\text{s})} + 2\text{KNO}_{3(\text{aq})}$$
- What is the hybridization of the central iodine atom in  $\text{I}_3^-$ ?
  - How is the Xenon atom in  $\text{XeF}_4$  hybridized?
- Draw structures for the straight-chain and ring forms of glucose.

每題 10 分