

大葉大學 94 學年度轉學招生考試試題紙

系	組	別	日\ 第二部	年級	考試科目 (中文名稱)	考試日期	節次	備註
分子生物科學系			日	二	化學	7月12日	4	13=30 ~ 14=50 可使用不可程式 計算機, 共=頁

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）

P2-1

- What is scientific method? What are the various parts of the scientific method? (10 points)
- Identify each of the following as a pure substance, a homogeneous mixture, or a heterogeneous mixture. (10 points)
  - gasoline
  - a stream with gravel at the bottom
  - air
  - brass
  - copper metal
- Name each binary compound. (10 points)
  - CsF
  - AlCl<sub>3</sub>
  - MgI<sub>2</sub>
- Under appropriate conditions at 1000°C, ammonia gas reacts with oxygen gas to produce gaseous nitrogen monoxide (common name, nitric oxide) and gaseous water. Write the unbalanced and balanced equations for this reaction. (10 points)
- When the prediction was made for whether a reaction will occur, what are the “driving forces” that pull the reactants toward products. (10 points)
- Isopentyl acetate, C<sub>7</sub>H<sub>14</sub>O<sub>2</sub>, the compound responsible for the scent of bananas, can be produced commercially. Interestingly, bees release about 1 μg (1x10<sup>-6</sup> g) of this compound when they sting. This attracts other bees, which then join the attack. How many moles and how many molecules of isopentyl acetate are released in a typical bee sting? (10 points)

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7. Propane,  $C_3H_8$ , when used as a fuel, reacts with oxygen to produce carbon dioxide and water according to the following unbalanced equation:



What mass of oxygen will be required to react exactly with 96.1g of propane? (10 points)

8. What is ideal gas law? (10 points)

9. Although milk is not a true solution (it is usually a suspension of tiny globules of fat, protein, and other substrates in water), it does contain a dissolved sugar called lactose. Cow's milk typically contains 4.5% by mass of lactose,  $C_{12}H_{22}O_{11}$ . Calculate the mass of lactose present in 175g milk. (10 points)

10. What is buffered solution? And how to use pH meter properly. (10 points)