

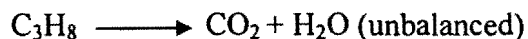
中國文化大學 103 學年度暑假轉學招生考試

系組：化學工程與材料工程學系二年級

日期節次：7 月 31 日第 2 節 10:50-12:10

科目：普通化學

一、44 g of propane reacts with air according to the following equation:



(1) Balance the equation. (10%)

(2) How many grams of CO_2 and H_2O were produced, respectively? (10%)

二、Based on quantum mechanism model answer the following question:

(1) Give the orbital designations of the electrons with the quantum number:

$n=2, l=1, m_l=1$. (5%)

(2) Which orbital in each of the pairs is higher: 3s or 2p. (5%)

(3) How many unpaired electrons are present in Li? (5%)

(4) Give the expected ground-state electron configurations for the following elements: Cu. (5%)

三、Use the Molecular Orbital diagram to describe the bonding in O_2 .

(1) What is the bond order of O_2 ? (10%)

(2) Does O_2 contain unpaired electrons? (10%)

四、Calculate the pH of 1 M CH_3COOH aqueous solution; K_a for CH_3COOH is 1.8×10^{-5} . (20%)

五、Use the Henderson-Hasselbalch equation to calculate the pH of a buffer solution that is 0.15 M in CH_3COOH and 1.5 M in CH_3COONa . (20%) (K_a for CH_3COOH is 1.8×10^{-5})