銘傳大學九十二學年度轉學生招生考試

七月二十五日　第四節

普通化學　試題

考生可使用計算機，常用的元素原子量如下
C: 12.01,　H:1.008,　N:14.01,　O:16.00,　S:32.07

一、解釋名詞(25%)

1. Electronegativity
2. Resonance
3. Stoichiometry
4. Electrolyte
5. Solubility
6. molarity
7. Free energy
8. Chirality
9. Colligative properties
10. Reversible reaction

二、配合題 (請從表格中找出正確答案) (25%)

1. hydrogen chloride
2. carbon dioxide.
3. chloric acid
4. methane
5. sodium hydroxide
6. zinc iodide
7. hydrocyanic acid
8. carbonic acid
9. potassium dichromate
10. ammonium sulfate

a	CO_2	j	NH_4SO_4	s	C_2H_6
b	$HClO_4$	k	H_2SO_4	t	KOH
c	$ZnCl_2$	l	NaOH	u	K_2CrO_4
d	H_2CN	m	$HClO_3$	v	$(NH_4)_2S$
e	CO	n	$K_2Cr_2O_7$	w	HCN
f	HCl	o	HCO_3	x	ZnI
g	$(NH_4)_2SO_4$	p	$HClO_2$	y	ZnI_2
h	H_2CO_3	q	SO_2	z	HBr
i	CH_4	r	C_2H_4		

三、非選擇題 (50%)

1. Which of these symbols provides more information about the atom: ^{23}Na or $_{11}Na$? Explain. (6%)

2. Nitrous oxide (N_2O) is also called "laughing gas." It can be prepared by the thermal decomposition of ammonium nitrate (NH_4NO_3). The other product is H_2O.
   (a) Write a balanced equation for the reaction.
   (b) How many grams of N_2O are formed if 0.46 mole of NH_4NO_3 is used in the reaction? (8%)

3. Dry ice is solid carbon dioxide. A 0.050-g sample of dry ice is placed in an evacuated 4.6-L vessel at 30^0C. Calculate the pressure inside the vessel after all the dry ice has been converted to CO^2 gas.
   (Gas constant R=0.082057 L · atm/K · mol) (5%)

4. A metal ion with a net +3 charge has five electrons in the 3d subshell. Identify the metal. (5%)

5. Classify these bonds as ionic, polar covalent, or covalent, and give your reasons:
   (a) the SiSi bond I $Cl_3SiSiCl_3$,
   (b) the SiCl bond in $Cl_3SiSiCl_3$,
   (c) the CaF bond in CaF_2,
   (d) the NH bond in NH_3. (12%)

6. Draw all the possible structural isomers for the molecule having the formula C_7H_7Cl. The molecule contains one benzene ring. (6%)

7. The concentrated sulfuric acid we use in the laboratory is 98.0 percent H_2SO_4 by mass. Calculate the molality and molarity of the acid solution. The density of the solution is 4.83 g/ml. (8%)

試題完