國立高雄師範大學 106 學年度學士班轉學生招生考試試題

系所別：化學系、生物科技系二年級

科　目：普通化學

※注意：1.不必抄題，作答時請將試題題號及答案依照順序寫在答案卷上，於本試題上作答者，不予計分。

2.限用藍色或黑色之鋼筆、原子筆作答，以鉛筆或其他顏色作答者不予計分。

1 H 1.0																	2 He 4.0
3 Li 6.9	4 Be 9.0											5 B 10.8	6 C 12.0	7 N 14.0	8 O 16.0	9 F 19.0	10 Ne 20.2
11 Na 23.0	12 Mg 24.3											13 Al 27.0	14 Si 28.1	15 P 31.0	16 S 32.1	17 Cl 35.5	18 Ar 40.0
19 K 39.1	20 Ca 40.1	21 Sc 45.0	22 Ti 47.9	23 V 50.9	24 Cr 52.0	25 Mn 54.9	26 Fe 55.8	27 Co 58.9	28 Ni 58.7	29 Cu 63.5	30 Zn 65.4	31 Ga 69.7	32 Ge 72.6	33 As 74.9	34 Se 79.0	35 Br 79.9	36 Kr 83.8

For the following problems, each accounts for 10 points:

1. Consider two samples of gas at the same volume and temperature that each contains 1.0 mol of gas. Sample A contains H_2 and sample B contains an unknown gas. The ratio of the impacts per second of gas A with the walls of the container to the impacts per second of gas B with the walls of the container is 4. Identify gas B.（10％）

2. A mixture of $O_2(g)$ and $O_3(g)$ is present at equilibrium in a rigid container at 152 torr and 125° C. The density of the gaseous mixture is 0.228 g/L. Calculate K_p at 125° C for the reaction $3O_2(g) \rightleftharpoons 2O_3(g)$.（10％）

3. The overall K_f for the complex ion $Ag(NH_3)_2^+$ is 1.7×10^7. K_{sp} for AgI is 1.5×10^{-16}. What is the molar solubility of AgI in a solution that is 2.0 *M* in NH_3？（10％）

4. Liquid A has vapor pressure *x*. Liquid B has vapor pressure *y*, and $x > y$. What is the mole fraction of A in the liquid mixture if the vapor above the solution is 30% A？（10％）

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5. Which charge(s) of N_2 would give a bond order of 2? Explain why？（10％）

6. What is the SO_4^{2-} concentration of a solution prepared by dissolving 3.00 g of Na_2SO_4 in 1.00 L of water？（10％）

7. Classify the following compounds as strong, weak, or nonelectrolytes：（10％）
(a) NaI　（b） $NaC_2H_3O_2$　（c） NH_3　（d） $CaCO_3$

8. What is the oxidation state of the bold element in each compound below？（10％）
(a) **Fe**Cl_2　（b） Na_2**S**O_3　（c） H_2**O**$_2$　（d） Na_3**P**O_4

9. What are the assumptions behind the concept of an ideal gas？（10％）

10. Under what conditions is the internal energy change of the system equal to the heat flow for a chemical reaction？And why？（10％）