無機化學選擇題共 10 小題，每一小題 5 分，答錯一小題扣 10 分。

( ) 1.The mixture of methyl acetate and chloroform would be expected to have
(1) maximum boiling point (2) minimum boiling point.

( ) 2.The mixture of cyclohexane and ethanol would be expected to have
(1) maximum boiling point (2) minimum boiling point.

( ) 3 Which of the following complexes conform to the EAN rule(Rule of 18)?
(1)$Ni(NH_3)_6^{2+}$ (2) $Co(NH_3)_6^{3+}$ (3) $Ni(PPh_3)_4(CO)_2$ (4) $Ni(CO)_4$

( ) 4.The approximate pKa values for the acid H_3PO_4 is
(1) 1 (2) 2 (3) 3 (4) ∞

( ) 5.The rate of reaction of O_2 with trans-$IrX(CO)(PPh_3)_2$ in benzene decreases in the order X = (1) NO_2>F>Cl>Br>I (2) I>Br>Cl>F (3)NO_2>ONO_2>N_3

( ) 6.The rate constants for the following two rections are k1 and k2, respectively.
$[Fe(H_2O)_6]^{2+} + Cl^- \rightarrow [Fe(H_2O)_5Cl]^+ + H_2O$ (k1)
$[Ru(H_2O)_6]^{2+} + Cl^- \rightarrow [Ru(H_2O)_5Cl]^+ + H_2O$ (k2), Then
(1) k1 > 100 * k2 (2) k1 < 0.01* k2 (3) k1 ≈ 0.01*k2 ~ 100*k2

( ) 7.The cation/anion radio ratio (by using plane geometry) for a triangular arrangement of anions in which the cation is in contact with the anions but does not push them apart is (1) 0.866 (2) 6.45 (3) 0.155 (4) 1.155

( ) 8.What is the effect on the acidity if SiO_2 is added to molten Fe+FeO?
(1) increase acidity (2) no effect (3) decrease acidity

( ) 9. What is the effect on the acidity if $CuSO_4$ is added to $(NH_4)_2SO_4$?
(1) increase acidity (2) no effect (3) decrease acidity

( )10.When CO is bonded to a metal, the CO ligand will donates the lone pair on
(1) carbon (2) oxygen to the metal.

(背面仍有題目,請繼續作答)

分析化學選擇題共 5 小題，每一小題 10 分，答錯一小題扣 15 分。

( ) 1. To prepare a solution of NaCl, you weight out 2.634(±0.002)g and dissolve it in a volumetric flask whose volume is 100.00±0.08 mL.Express the molarity of the resulting solution, and its uncertainty, with the correct number of significant figures. Given:Na=22.990 g/mol; Cl=35.453 g/mol.
(1) 0.26340±0.00008 M; (2) 0.4507±0.0005 M; (3)0.263±0.002 M;
(4) 0.45±0.08 M

( )2. A 30.00 mL solution containing an unknown amount of I^- was treated with 50.00 mL of 0.3650 M $AgNO_3$. The precipitated AgI was filtered off, and the filtrate (plus Fe^{3+}) was titrated with 0.2780 M KSCN. When 37.60 mL had been added, the solution turned red. How many milligrams of I^- were present in the original solution ? Given: Ag=107.868 g/mol; I=126.904 g/mol. (1) 33.0 mg; (2) 990 mg; (3) 39.4 mg; (4) 1326 mg;

( )3. A solution contains plumbous (Pb^{2+}) and mercurous (Hg_2^{2+}) ions, each at a concentration of 0.010 M. What is the percentage of the plumbous (Pb^{2+}) ion that will precipitate when the concentration of Hg_2^{2+} is reduced to 0.01% of its original value by adding iodide to the solution? Given:
$PbI_2(s) = Pb^{2+} + 2\,I^-$ $\quad Ksp = 7.9 * 10^{-9}$
$Hg_2I_2(s) = hg_2^{2+} + 2\,I^-$ $\quad Ksp = 1.1 * 10^{-28}$
(1) 0%; (2) 0.01%; (3) 0.1%; (4) 1%;

( )4. How many grams of ammonium chloride (MW=53.5) and how many milliliters of concentrated ammonium hydroxide (16.0 M) should be dissolved, mixed, and diluted to 100 mL to prepare a solution with a pH of 9.00 and a total molar concentration of 5.00 M? The pKb of NH_4OH is 4.76.
(1) 15.1 g and 13.6mL; (2) 16.3 g and 12.2 mL; (3) 17.1 g and 11.4 mL;
(4) 18.5 g and 9.6 mL;

( )5. How will the pH of pure water change with increasing temperature?
(1) Increase; (2) Decrease; (3) no change;