

20098

私立臺北醫學院 89 學年度第 1 學期 ~~期中~~ ~~期末~~ 考試 (試) 命題紙

系級	科目	授課教師	考試日期	學號	姓名
牙一	普通化學	鄭惠華	90年1月11日第2節		

※①請注意本試題共 3 張。如發現頁數不足及空白頁或缺印，應當場請求補齊，否則缺少部份概以零分計。
 ②每張試題卷務必填寫(學號)、(姓名)。

牙一普化 鄭惠華教授

Filling the following blanks in English: (30%)

- A polymer formed when a small molecule is condensed out of two reactants is called a _____ polymer.
- _____ rapidly polymerizes to form silicone.
- _____ (tacticity) polymer is a rigid substance with an excellent resistance to mechanical stress.
- Linear and branched polymers are found in a class of materials known as _____. These materials flow when heated and can be molded into a variety of shape.
- A _____ (high or low) glass transition temperature gives Plexiglass the glasslike properties.
- PVC is poly(vinyl chloride). It is built from the monomer _____ (chemical formula).
- The initiation step of an addition polymerization uses _____ such as _____.
- Grignard reagents are hybrids of ionic and covalent Lewis structures, _____, which are good sources of negatively charged carbon atoms.
- _____ polymerization produces a polymer in which both the linearty and the tacticity can be carefully controlled.
- Superoxide dismutase (enzyme) is a _____.
- The first synthetic polymer was called _____.

20048-2

私立臺北醫學院 89 學年度第 1 學期 期中考試 (命) 題紙

系級	科目	授課教師	考試日期	學號	姓名
牙一	普通化學	莊麗貞	90年1月11日第2節		

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Final Examination of General--/Analytical Chemistry

For the Students of the Department of Dentistry

A. Fill out the blanks with the most proper answer (each 3%, total 48%)

- The main reason(s) for the color change of indicators are
 - _____
 - _____
- The treatment of the results from an acid-base titration is always assisted by mathematical method(s), that is the end point can be obtained by the calculated _____ to be maximum, if such an estimation still shows an obscure end point to be decided, the another parameter _____ to be nil (zero) is always taken for the determination of the end point.
- The common polydentate ligands often used in chelatometric titrations are _____ and _____ etc..
- In the titration of Ca^{2+} and Mg^{2+} in the presence of some interfering ions such as Cd^{2+} and Zn^{2+} , the latter should be firstly excluded by adjusting the pH value to _____ to precipitate these ions with EDTA, after filtration, the sample solution is readjusted to a pH of _____ by ammonium buffer to continue the titration of Ca^{2+} and Mg^{2+} .
- The condition required for an adsorption indicator e.g. fluorescein is that the surface of the precipitating particle must bear _____ charged ions which can thus attract the _____ charged indicator ions.
- The heterocyclic ring structure formed by a central metallic ion combined with several ligands (molecules) are called a _____.
- The _____ is the unique apparatus that can emit characteristic wave length which is in turn quantitatively absorbed by the characteristic element present in the sample.
- The value of K_{absolute} is pH-_____, while $K_{\text{effective}}$ is pH-_____.

B. Select proper item and mark its symbol in the parenthesis (each 2%, total 12%)

- In the functionalities $>\text{C}=\text{O}$, or $>\text{C}=\text{C}<$, the energy gaps of $\sigma \rightarrow \sigma^*$ transitions are always
 - larger
 - smaller
 - is the same dimension as (than) those of the $\pi \rightarrow \pi^*$ transitions.
- In acid-base titrations, the color change of the indicator usually covers a pH range of
 - $\text{p}K_{\text{in}} \pm 10$
 - $\text{p}K_{\text{in}} \pm 1$
 - $\ln \text{p}K_{\text{in}} \pm 1$
- The condition for an optimum EDTA titration is
 - in medium pH,

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牙一	普通化學	林麗貞	90年1月11日第2節		

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務務嚴正專用

- b). 1:1 for metal and the ligand, c). the K_{sp} must be very large enough.
- () 4. A compound bearing an acidity or a basicity weaker than the water is apt to be successfully analyzed by a). the complexometric titration b) the non-aqueous titration. c). the chelatometric titration
- () 5. In a complexometric titration, such as for the overall equilibrium,
 $K_{affinity} = (ML_n) / (M)(L)^n$, the condition requires that a). $K_{affinity} > 10^8$
 b). $K_{affinity} < 10^8$
- () 6. Which of the following resulting solution (200 mL) will turn to blue? a) A mixture of 1.0 mmoles of Eriochrome Black T + 10 mmoles of calcium ions + 5 mmoles of EDTA b). A mixture of 1.0 mmoles of Eriochrome Black T + 10 mmoles of calcium ions c). 1.0 mmoles of Eriochrome Black T + 10 mmoles of calcium ions + 30 mmoles of EDTA

C. Question (s) (10%)

1. In the EDTA titration for Ca^{2+} , Eriochrome Black T is usually used as the indicator. Why the end point is decided when the color changes from reddish purple to blue? Formulate simplified equations to explain this phenomenon.