

- | | |
|----------------------------------|-----------------------------------|
| A. increase, decrease, increase | C. decrease, increase, decrease |
| B. no effect, increase, decrease | D. decrease, no effect, no effect |

14.	Choose an appropriate indicator to identify the equivalence point in the titration of 25.0 mL of 1.5 M NH_3 with 1.5 M HCl . Assume volumes are additive.										
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	A. thymol blue B. methyl orange C. cresol red D. phenolphthalein										

15.	Calculate the solubility (in grams per liter) of Ag_2CO_3 . The solubility product for Ag_2CO_3 is 8.0×10^{-12} .
	A. 4.7×10^{-7} B. 2.0×10^{-4} C. 1.3×10^{-4} D. 3.5×10^{-2}

16.	What is the oxidation state of nickel in $\text{Ni}(\text{CO})_4$?
	A. 0 B. 2 C. 3 D. 4

17.	What are the oxidation numbers of potassium and iron, respectively, in $\text{K}_4[\text{Fe}(\text{CN})_6]$?
	A. +1, +2 B. +2, +3 C. +2, +1 D. +1, +3

18.	Potassium ferricyanide has the formula $\text{K}_3[\text{Fe}(\text{CN})_6]$. Give its systematic name.
	A. potassium hexacyanoferrate (III) C. potassium ferrihexacyanide B. potassium hexacyanideiron (III) D. potassium sexacyanoiron (II)

19.	In which of the following aqueous solutions would addition of AgNO_3 result in the precipitation of 3 moles of AgCl per mole of complex compound?
	A. $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$ C. $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]\text{Cl}$ B. $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$ D. all of the above

20.	The correct name for the $[\text{Co}(\text{en})_2\text{Br}_2]^+$ ion is:
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- A. dibromodiammincobalt (II) ion
- B. ethylenediaminedibromocobalt (II) ion
- C. bis(ethylenediamine)cobalt (III) bromide
- D. dibromobis(ethylenediamine)cobalt (III) ion

21.	The correct formula for tetrahydroxozincate (II) ion is:				
	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">A. Zn(OH)^+</td> <td style="width: 50%;">C. Zn(OH)^-</td> </tr> <tr> <td>B. $\text{Zn(OH)}_2(\text{H}_2\text{O})^-$</td> <td>D. $\text{Zn(H}_2\text{O)}^+$</td> </tr> </table>	A. Zn(OH)^+	C. Zn(OH)^-	B. $\text{Zn(OH)}_2(\text{H}_2\text{O})^-$	D. $\text{Zn(H}_2\text{O)}^+$
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22.	A complex with the composition $[\text{MA}_2\text{B}_2]\text{X}_2$ is found to have no geometrical isomers. A and B are monodentate ligands. The structure of the complex is
	A. linear. B. square planar. C. tetrahedral. D. octahedral.

23.	Which of the following is an incorrect statement?
	<ul style="list-style-type: none"> A. The donor atom in a ligand contributes an electron pair to the central metal ion in a complex. B. Bidentate and polydentate ligands are called chelating agents. C. In transition metal complexes the metal ions are Lewis bases. D. Coordination compounds may display geometric and/or optical isomerism.

24.	The CN^- ion is a strong-field ligand. For the octahedral complex ion, $[\text{Fe(CN)}_6]^{3-}$, choose the correct spin complex and the number of unpaired electrons present.				
	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">A. high spin; five unpaired electrons</td> <td style="width: 50%;">C. high spin; four unpaired electrons</td> </tr> <tr> <td>B. low spin; one unpaired electron</td> <td>D. low spin; zero unpaired electrons</td> </tr> </table>	A. high spin; five unpaired electrons	C. high spin; four unpaired electrons	B. low spin; one unpaired electron	D. low spin; zero unpaired electrons
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25.	Which of the following hydrated cations is colorless?
	A. Mn^{2+} B. Sc^{3+} C. Ti^{3+} D. Cu^{2+}