

(Choose the correct option, only one is correct)

1. Find the correct option in which both ligands form same member rings with central metal ion -

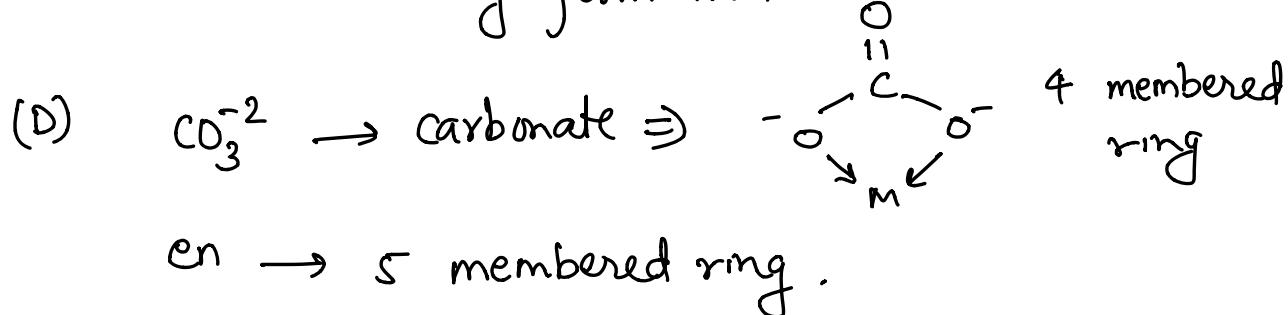
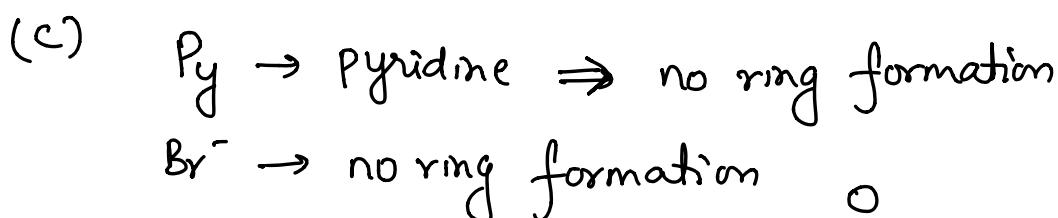
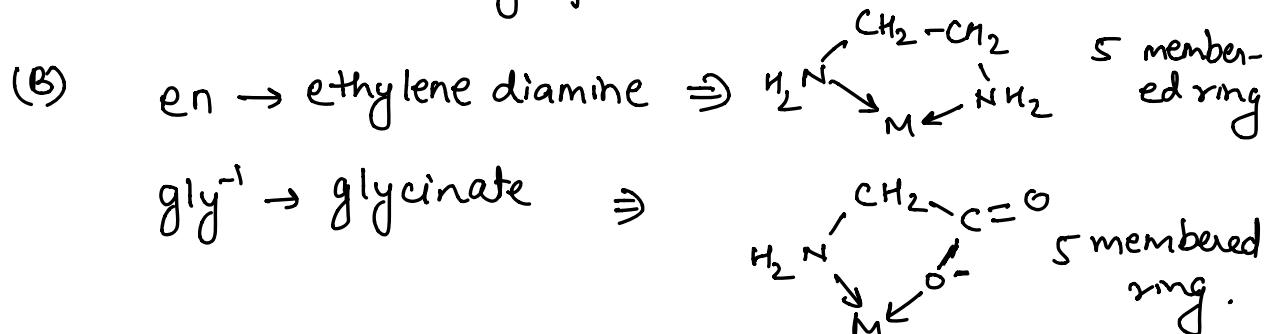
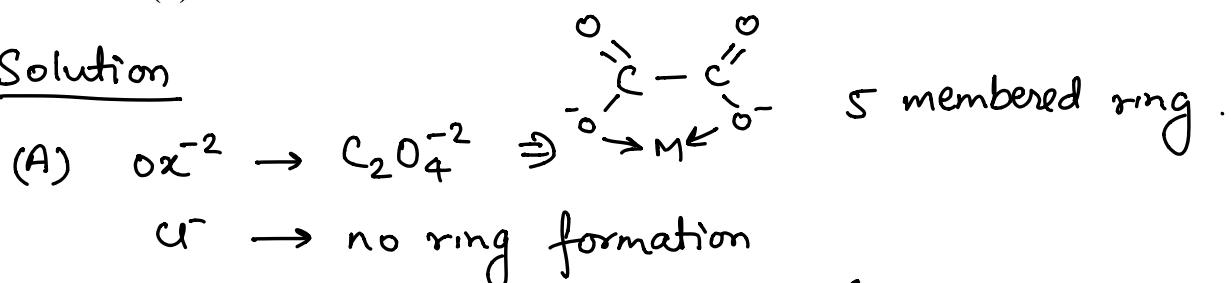


निम्न में से वह सही विकल्प चुनियें जिसके दोनों लिगेण्ड केन्द्री; /गतु आयन के साथ] वलयों की समान सं [; 1 बनाते हैं -



1. Ans. (B)

Solution



2. Diethylene triamine is
(A) Chelating ligand (B) Poly dentate ligand (C) Tridentate ligand (D) All of these

डाइएथिलीन ट्राइऐमीन है

[3]

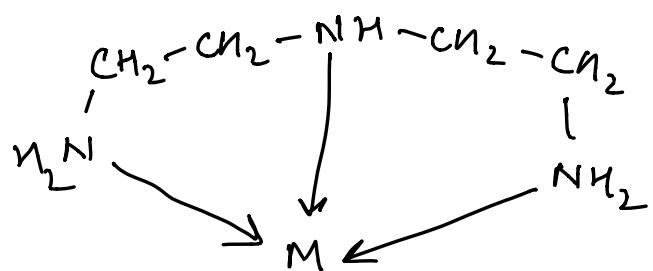
(A) कीलेटिंग लिगेण्ड (B) बहुदन्तुक लिगेण्ड

(C) त्रिदन्तुक लिगेण्ड (D) उपरोक्त सभी

2. Ans. (D)

Solution

Diethylene triamine \rightarrow dien.



It is a chelating ligand.

It is tridentate ligand (polydentate)

3. Which of the following ligand can act as chelating agent but does not have chiral centre ?

(A) nta³⁻ (B) bn (C) pn (D) None of these

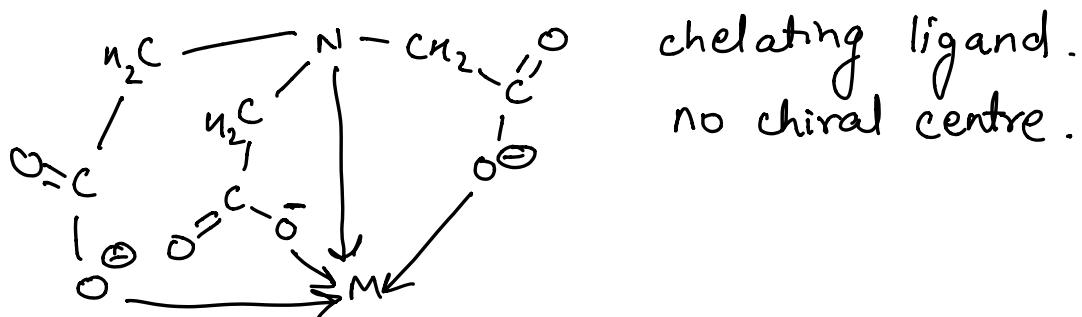
निम्न में से कौनसा लिगैण्ड कोलेटिंग अभिकर्मक के : प में कार्य कर सकता है लेकिन जिसमें किरैल केन्द्र उपस्थित नहीं है?

(A) nta³⁻ (B) bn (C) pn (D) इनमें से कोई नहीं

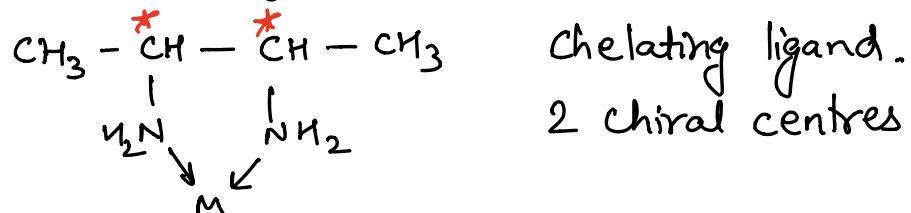
3. Ans. (A)

Solution

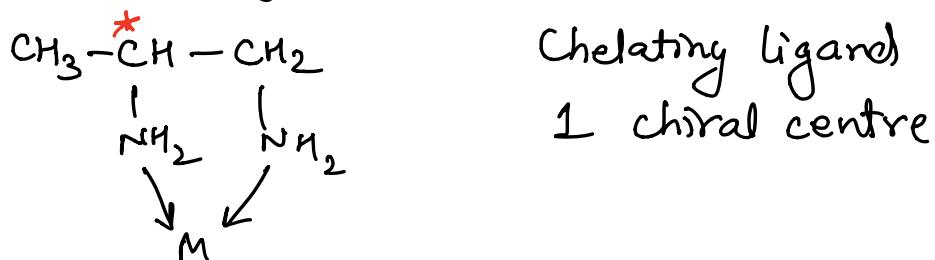
(A) nta³⁻ → nitrilotriacetate



(B) bn → butylenediamine



(C) pn → propylenediamine.

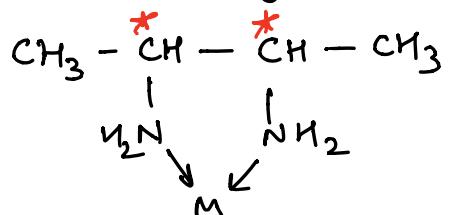


More than one may be correct

Solution

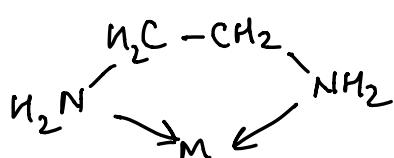
- (A) Py → monodentate ligand

- (B) $\text{bn} \rightarrow \text{butylenediamine}$



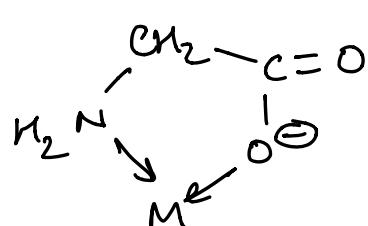
Bidentate ligand.
2 chiral centres
similar donor atoms

- (c) en → ethylenediamine



Bidentate ligand
similar donor atoms

- (D) $\text{gly}^{-1} \rightarrow \text{glycinate}$



Bidentate ligand
different donor atoms

5. Which of the following is an example of ambidentate ligand ?

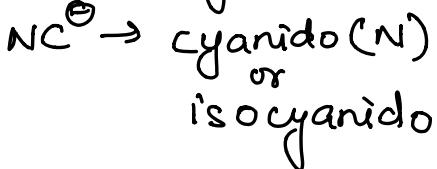
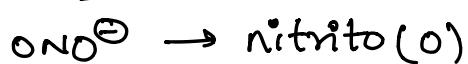
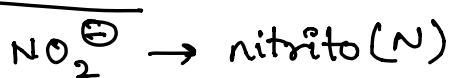


5. निम्न में से कौन] उभयदन्तुक लिगेण्ड का ,क उदाहरण हैं।



5. Ans. (A,B,C)

Solution



H^- is not ambidentate .

Match the List with multiple options

6. List-I

- (P) Ethane 1, 2 diamine
- (Q) SCN^-
- (R) CO_3^{2-}
- (S) NO_2^-

Code :

	P	Q	R	S
(A)	1	2	3	4
(C)	4	1	3	2

List-II

- (1) Chelating agent
- (2) Ambidentate
- (3) Flexidentate
- (4) Tridentate

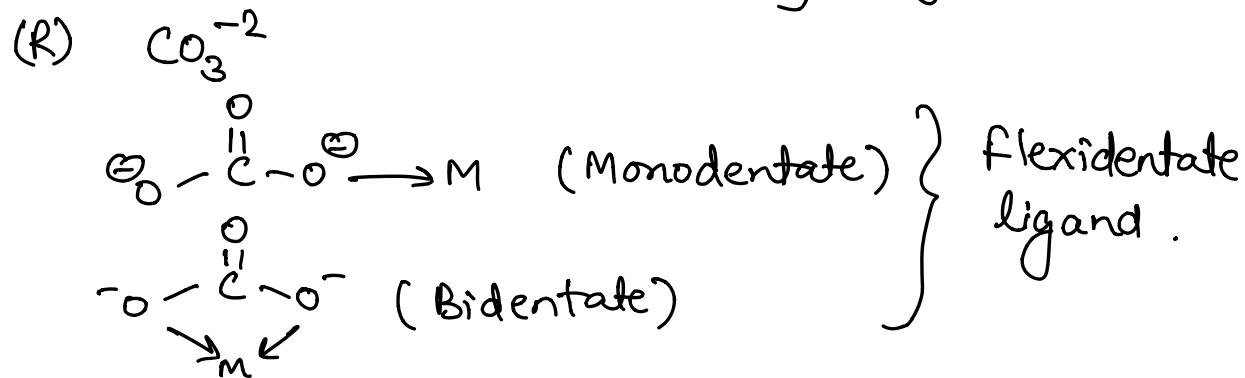
	P	Q	R	S
(B)	1	2	3	2
(D)	4	1	2	4

Ans. (B)

Solution

(P) Ethane 1, 2 diamine \rightarrow ethylene diamine \rightarrow en
 (IUPAC name) chelating ligand.

(Q) $\text{SCN}^- \rightarrow$ thiocyanato (S) } Ambidentate
 $\text{NCS}^\ominus \rightarrow$ thiocyanato (N) } ligand



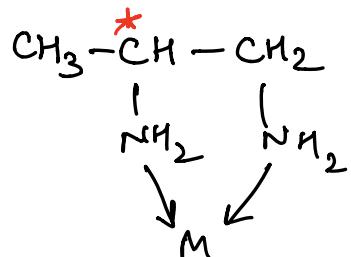
(S) $\text{NO}_2^\ominus \rightarrow$ nitrito (N) } Ambidentate
 $\text{ONO}^\ominus \rightarrow$ nitrito (O) } ligand

Comprehension (Q.7 to Q.8)

Ligands can be classified by various ways, based upon charges, denticity and interaction between ligand and central atom.

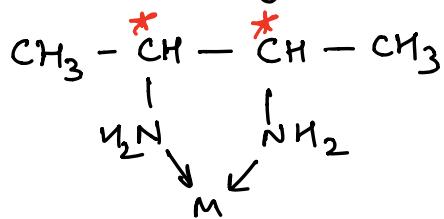
Solution

(7)(A) $\text{pn} \rightarrow$ propylenediamine.



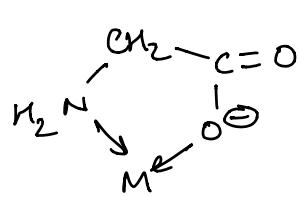
Chelating ligand
1 chiral centre
unsymmetrical

(B) $\text{bn} \rightarrow \text{butylenediamine}$



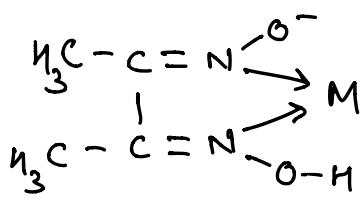
Bidentate ligand.
2 chiral centres
symmetric

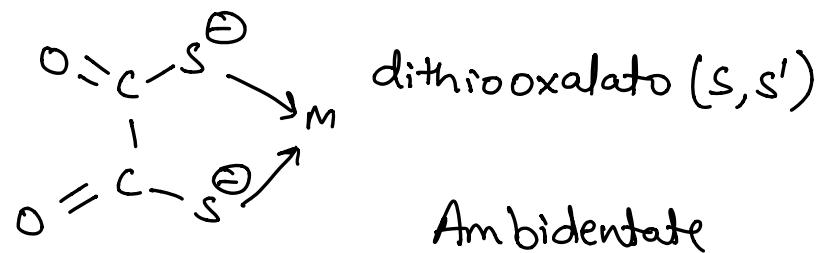
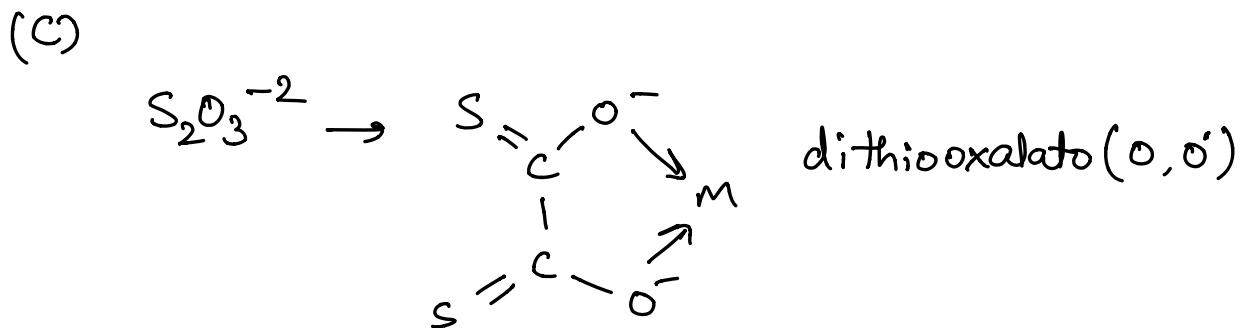
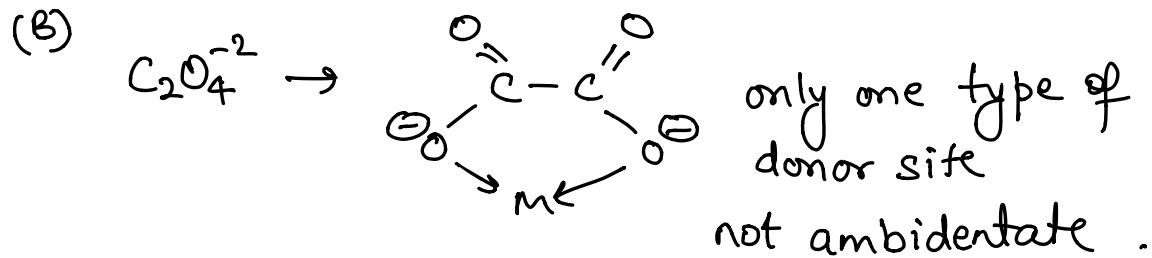
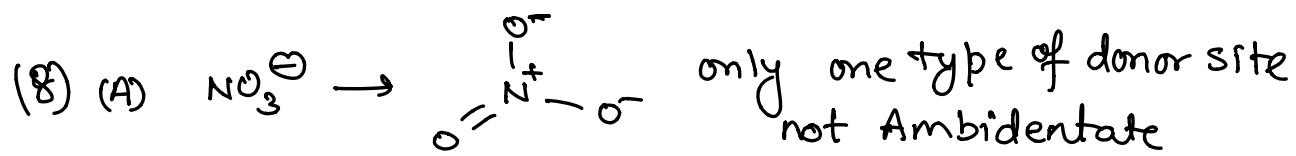
(c) $\text{gly}^{-1} \rightarrow \text{glycinate}$



Bidentate ligand
different donor atoms
unsymmetrical but no
chiral centre

(D) $\text{dmg}^- \rightarrow$ dimethyl glyoxime
no chiral centre
unsymmetrical





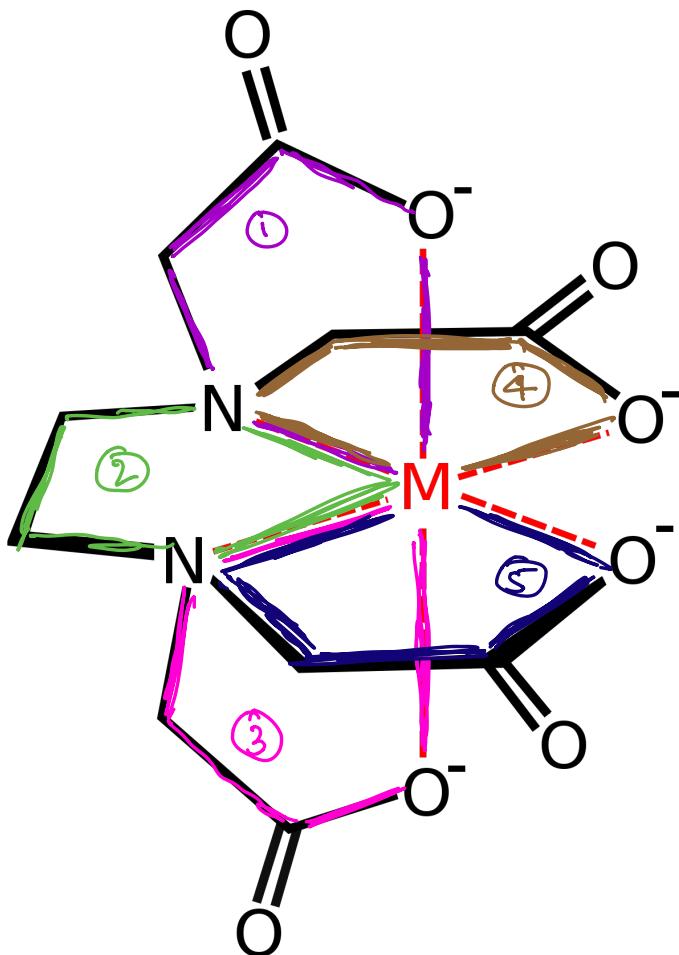
Integer

9. Find the total number of 5-membered rings present in $[\text{Co}(\text{EDTA})]^-$.

$[\text{Co}(\text{EDTA})]^-$ में उपस्थित 5-सदस्यी; बलयों की कुल संख्या क्या है।

9. Ans. (5)

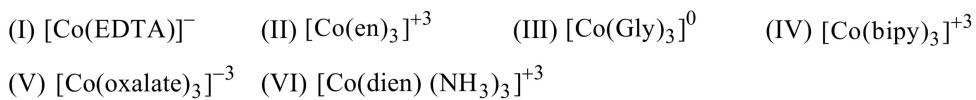
Solution



where M
is Co.

Clearly we
can see
five 5-membered
rings.

10. Find the number of complex(es) which have at least one five member chelate ring formed by two carbon atoms, two nitrogen atoms and one central metal.



10. Ans. 4

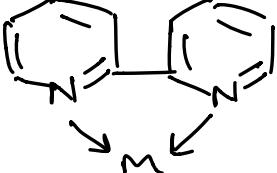
Solution

(I) one five membered ring formed by 2C, 2N
(d₉ ring no. 2)

(II) en forms ring with 2C, 2N .

(III) gly⁻¹ has only one N & one C . (incorrect)

(IV) bipy \rightarrow bipyridine
ring with 2C, 2N



(V) ox⁻² does not has nitrogen (incorrect)

(VI) dien forms 2 rings with 2C, 2N .