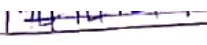
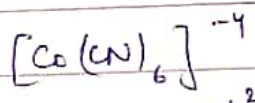
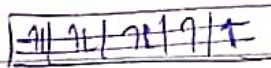
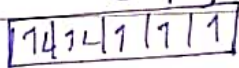



Fe<sup>2+</sup>  d<sup>2</sup>sp<sup>3</sup>

☆☆ (10)



Co<sup>+2</sup>: 

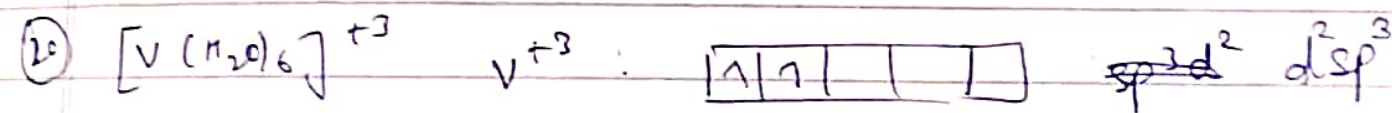
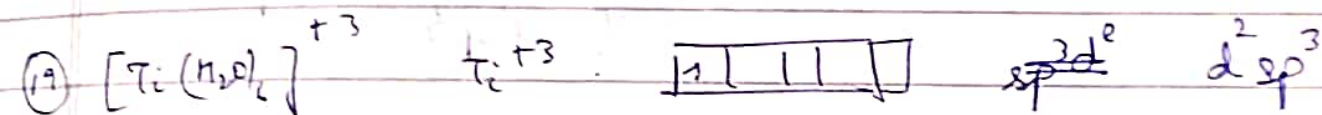
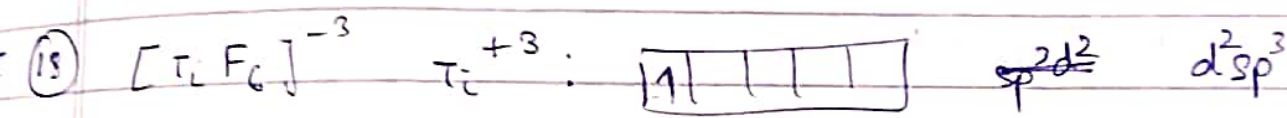
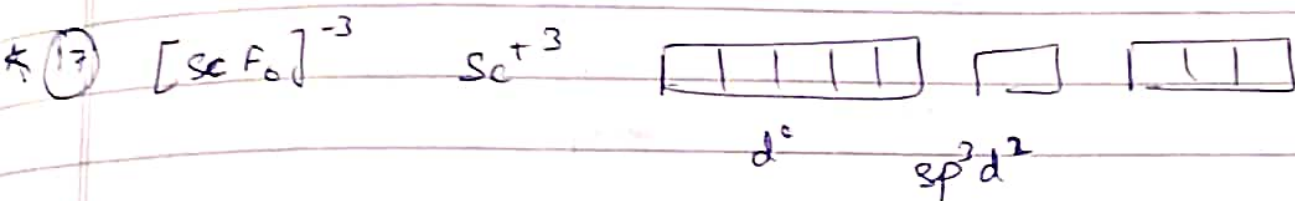


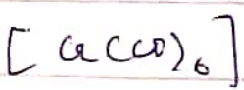
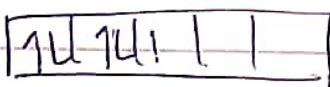


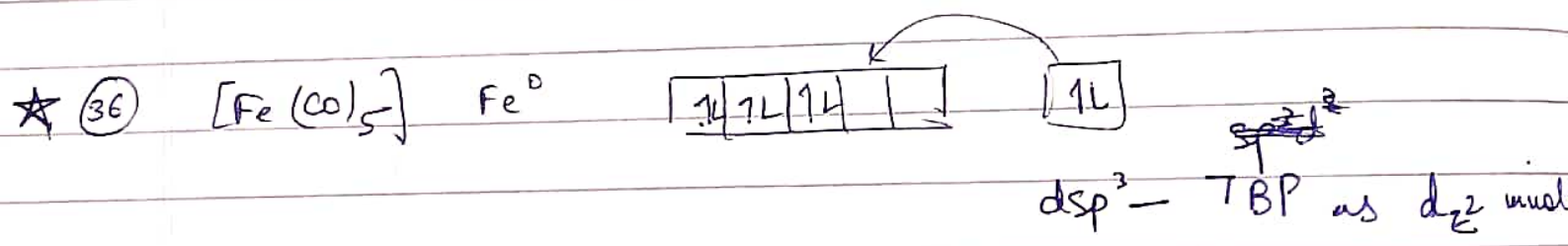
~~sp<sup>3</sup>d<sup>2</sup>~~  
d<sup>2</sup>sp<sup>3</sup>

Co<sup>+2</sup> → Co<sup>+3</sup>

1-3



 $Ca^{2+}$  $d^2 sp^3$



## Stereoisomerism in Octahedral Complexes

| Types of complex   | Geometrical Isomers (Cis + Trans) | Optical Isomers (O.A. + O.Inactive) | Total S.I  |
|--------------------|-----------------------------------|-------------------------------------|--|
| $[Ma_2b_2c_2]^n$   | 2(1Cis + 1Trans)                  | No Optical Isomers                  | 2  |
| $[Ma_2b_2c]^n$     | 2(1Cis + 1Trans)                  | No Optical Isomers                  | 2  |
| $[Ma_3b_3]^n$      | 2(1Cis + 1Trans)                  | No Optical Isomers                  | 2  |
| $[Ma_4b_2c]^n$     | 3(1Cis + 2Trans)                  | No Optical Isomers                  | 3  |
| $[Ma_4b_2cd]^n$    | 4(1Cis + 3Trans)                  | 5(2 + 3)                            | 5  |
| $[Ma_3b_3cd]^n$    | 5(1Cis + 4Trans)                  | 6(2 + 4)                            | 6  |
| $[Ma_2b_2c_2cd]^n$ | 6(2Cis + 4Trans)                  | 8(4 + 4)                            | 8 <span style="margin-left: 20px;">→ 3 cis, 3 trans</span> |
| $[Ma_2b_2c_2d]^n$  | 8(5Cis + 3Trans)                  | 15(12 + 3)                          | 15   |
| $[Ma_6cd]^n$       | 15(Cis & trans not defined)       | 30(30 + 0)                          | 30   |

| Types of complex   | Geometrical Isomers (Cis + Trans) | Optical Isomers (O.A. + O.Inactive) | Total S.I  |
|--------------------|-----------------------------------|-------------------------------------|--|
| $[M(AA)_3]^n$      | No Geometrical isomers            | 2(2 + 0)                            | 2  |
| $[M(AA)_2b_2]^n$   | 2(1Cis + 1Trans)                  | 2(2 + 1)                            | 3  |
| $[M(AA)_2bc]^n$    | 2(1Cis + 1Trans)                  | 3(2 + 1)                            | 3  |
| $[M(AA)_2b_2c]^n$  | 3(1Cis + 2Trans)                  | 4(2 + 2)                            | 4  |
| $[M(AA)_2b_2cd]^n$ | 2(1Cis + 1Trans)                  | No Optical Isomers                  | 2  |
| $[M(AA)_2bcd]^n$   | 4(2Cis + 2Trans)                  | 6(4 + 2)                            | 6 <span style="margin-left: 20px;">→ 2 cis, 1 trans</span> |
| $[M(AA)_2cd]^n$    | 6(Cis & trans not defined)        | 12(12 + 0)                          | 12   |

| Types of complex  | Geometrical Isomers (Cis + Trans) | Optical Isomers (O.A. + O.Inactive) | Total S.I   |
|-------------------|-----------------------------------|-------------------------------------|---|
| $[M(AB)_3]^n$     | 2(1Cis + 1Trans)                  | 4(4 + 0)                            | 4   |
| $[M(AB)_2c_2]^n$  | 5(1Cis + 4Trans)                  | 8(6 + 2)                            | 8   |
| $[M(AB)_2cd]^n$   | 6(2Cis + 4Trans)                  | 11(10 + 1)                          | 11 <span style="margin-left: 20px;">→ 3 cis, 2 trans</span> |
| $[M(AB)_2c_2d]^n$ | 4(2Cis + 2Trans)                  | 6(4 + 2)                            | 6   |
| $[M(AB)_2cd]^n$   | 3(1Cis + 2Trans)                  | 4(2 + 2)                            | 4   |
| $[M(AB)_2cd]^n$   | 7(4Cis + 3Trans)                  | 12(10 + 2)                          | 12 <span style="margin-left: 20px;">→ 5 cis, 2 trans</span> |
| $[M(AB)_2cd]^n$   | 12(Cis & trans not defined)       | 24(24 + 0)                          | 24  |