Question #65248, Chemistry / Physical Chemistry

1. State the oxidation state of the central atom in the following species:
(a) Si^{4+} Br4
(b) Cr^{3+} (NH3)6Cl3
(c) N^{5+} O3-
(d) P^{5+} O4^3-

2. Balance the following oxidation-reduction reaction in acidic solution:
MnO4

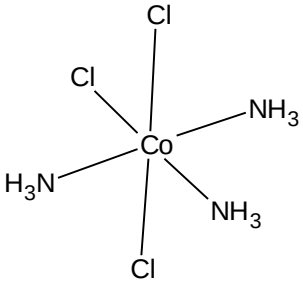
2MnO4- + 5C2O42-+16H+- >>>>>>> 2Mn2+ + 10CO2+8H2O

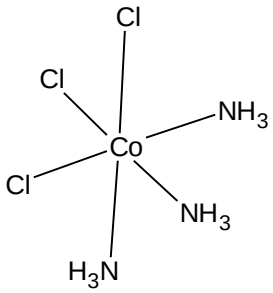
3. In general, analogous bonds weaken down a periodic group, whereas for dihalogen molecules, X2 we find the following bond strengths:

F-F 158; Cl-Cl 242; Br-Br 193; I-I 151 kJ mol-1

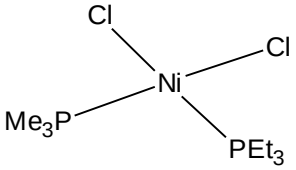
F – radius of atom is small, but the amount of electrons –large. As result electrons shoev off and destabilize the system. F-F – bond weaker than Cl-Cl. Br-Br – weaker than Cl-Cl, because radius of Br bigger than Cl.

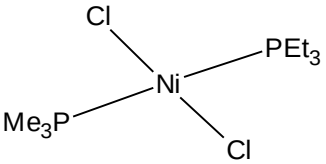
4. Draw all possible isomers of:
(a) [Co(NH3)3Cl3]



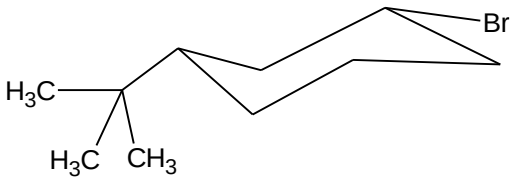


(b) [Ni(PMe3)(PEt3)Cl2]





6. Draw the most stable conformation for cis-1-bromo-3-(tert-butyl)cyclohexane. Justify your answer.



No interaction between two big group – bromo and tert-butyl in this conformation.