

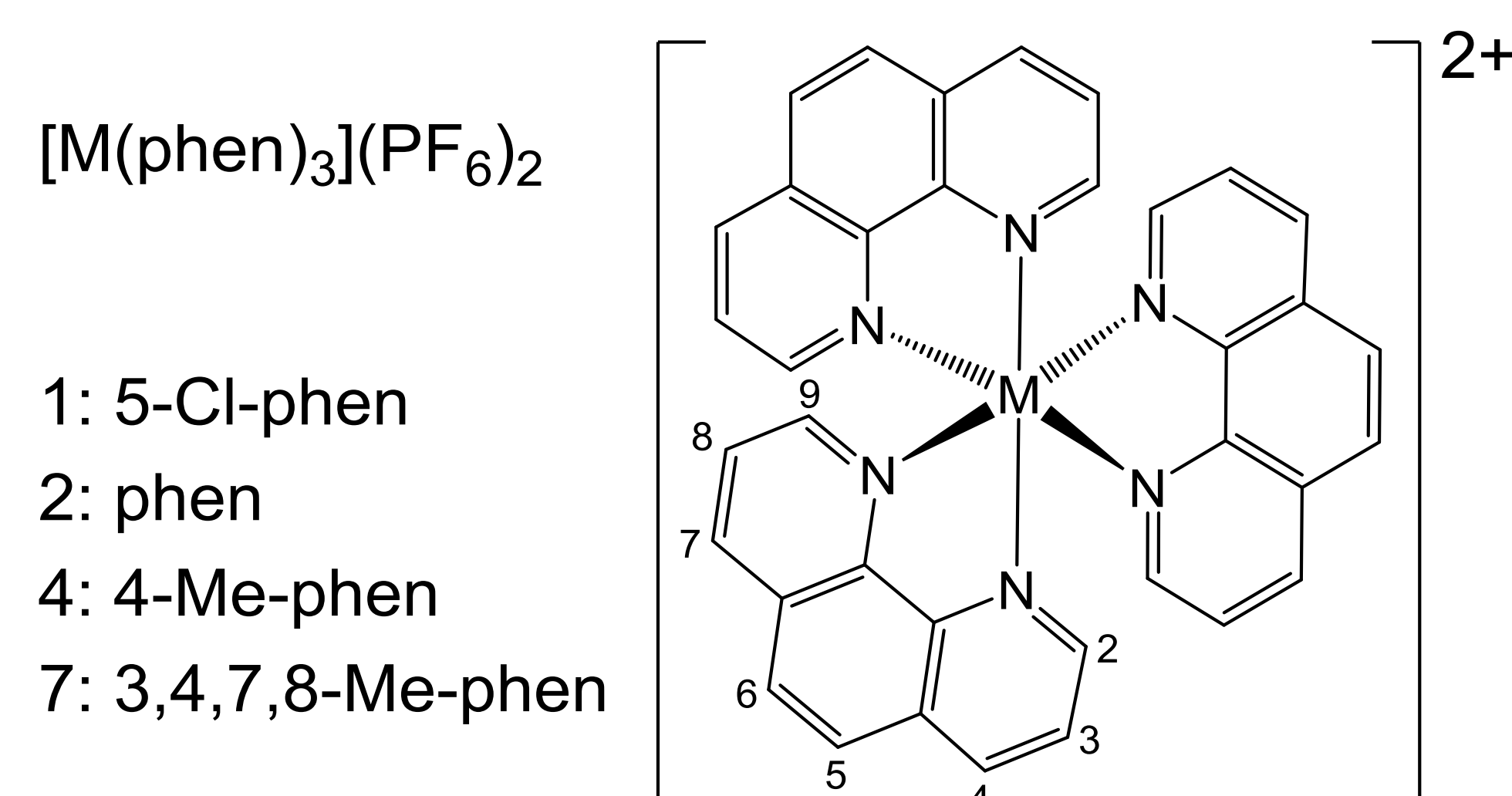
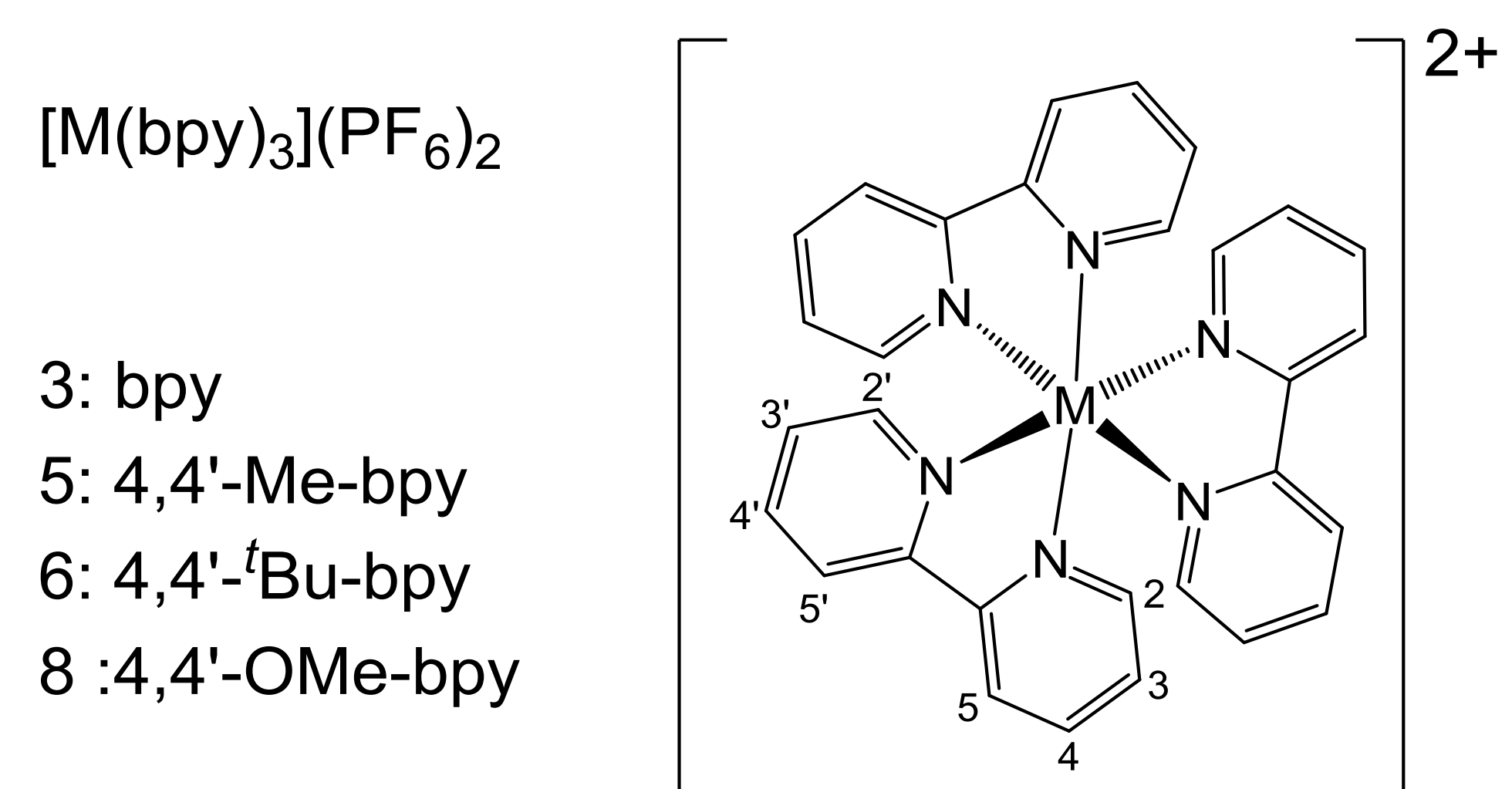
Redox behaviour of first row group 7, 8 and 9 transition metal complexes containing substituted bipyridines and phenanthrolines

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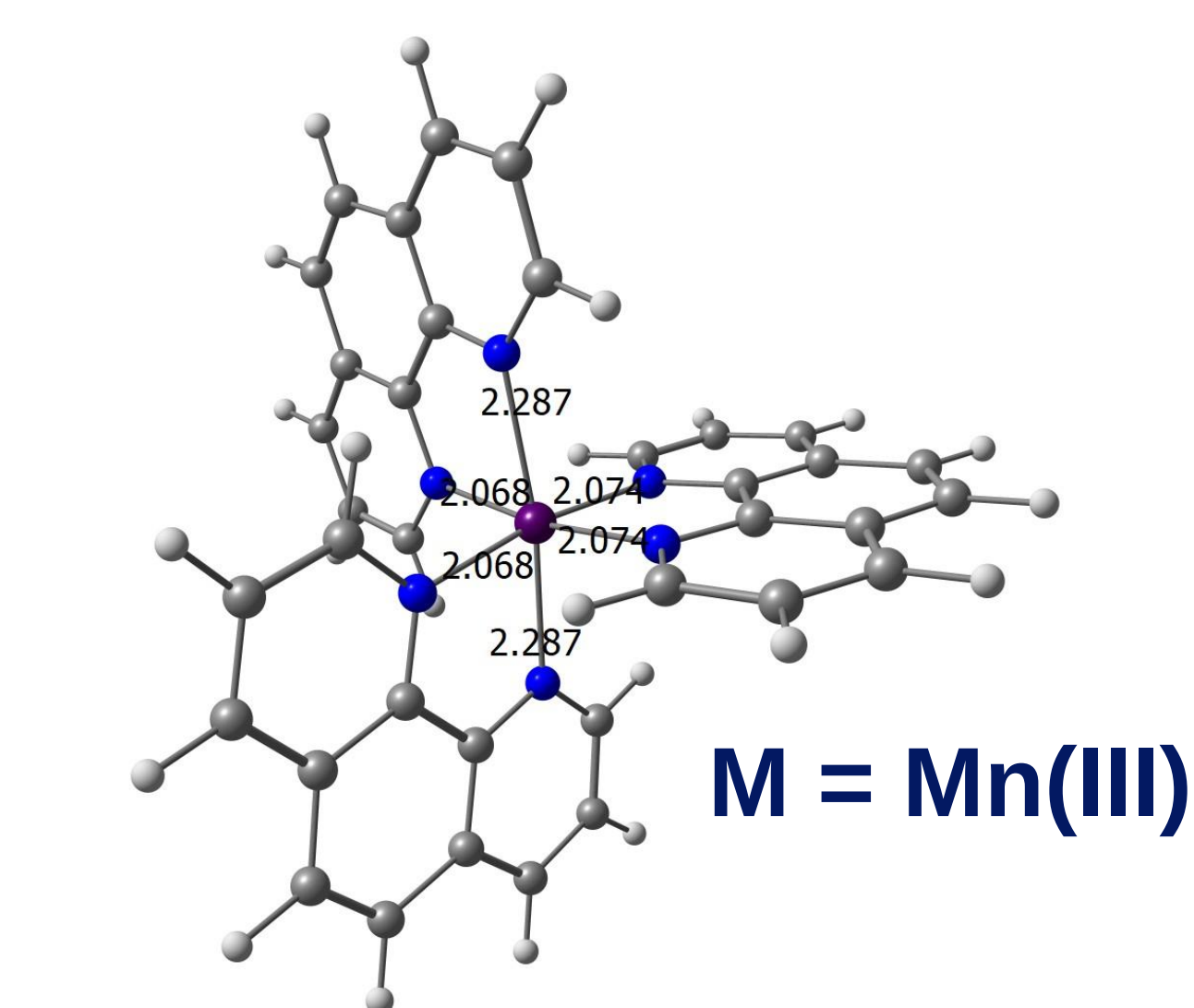
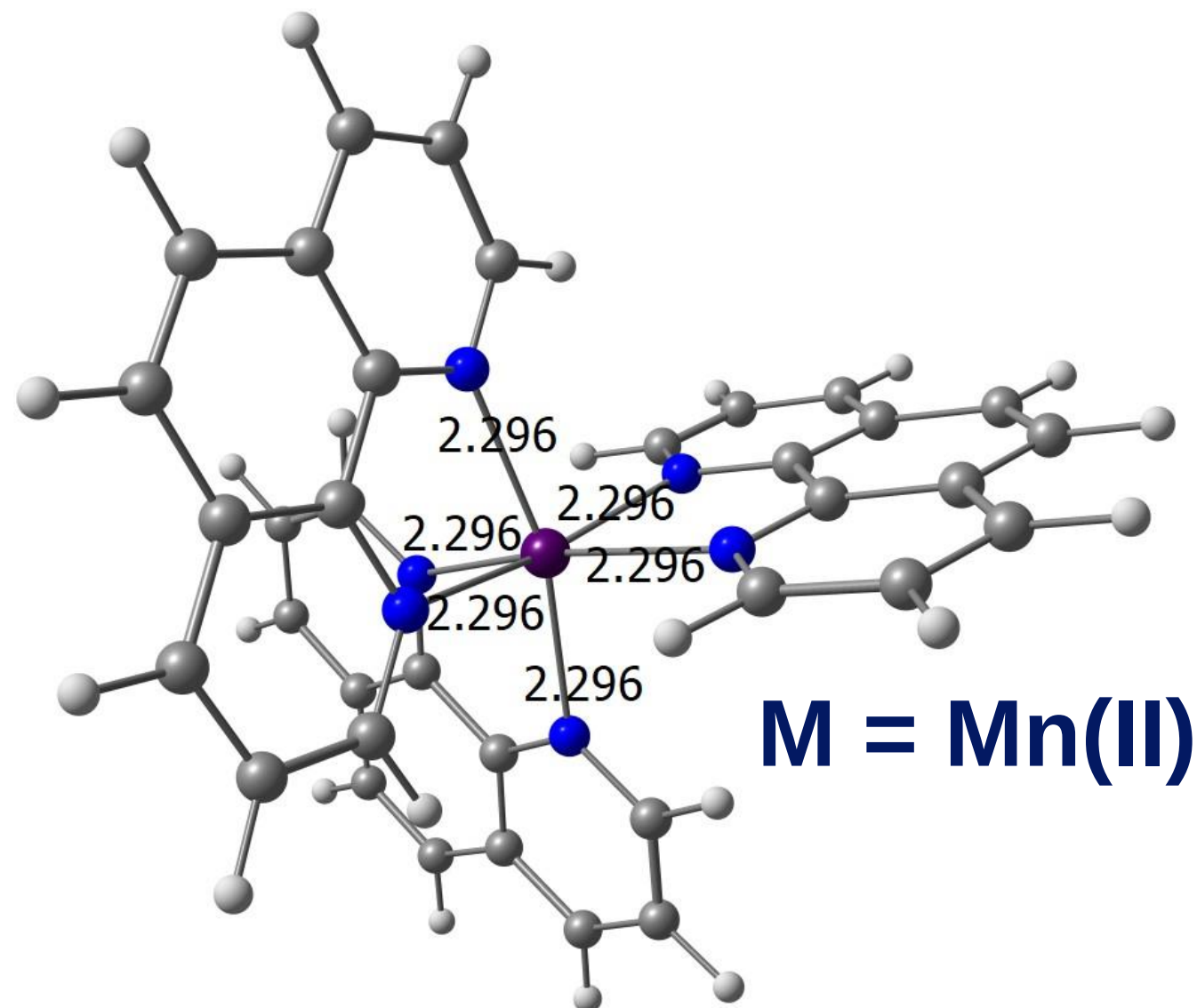
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- Oxidation and reduction of octahedral transition metal complexes, $[M^{\text{II}}L_3]^{2+}$, containing ligands L = bipyridine, phenanthroline, and substituted bipyridines and phenanthrolines were measured by cyclic voltammetry
- The oxidation for M = Mn, Fe and Co is metal based.
- The first reduction for M = Co is metal based and for M = Mn and Fe ligand based.
- The 2nd and further reductions M = Mn, Fe and Co are ligand based.
- The oxidation for M = Fe and Co is reversible, for Mn irreversible.
- Geometry distortion or electron rearrangement upon oxidation provides possible reasons for the observed irreversible electrochemical behaviour of the Mn(II/III) redox couple.
- The redox behaviour of $[M^{\text{II}}L_3]^{2+}$ with M = Mn, Fe or Co follow similar trends
- The metal-based oxidation potentials are related to theoretically calculated energies.
- Linear relationship can be used to predict electrochemical responses of related $[M^{\text{II}}L_3]^{2+}$ complexes.

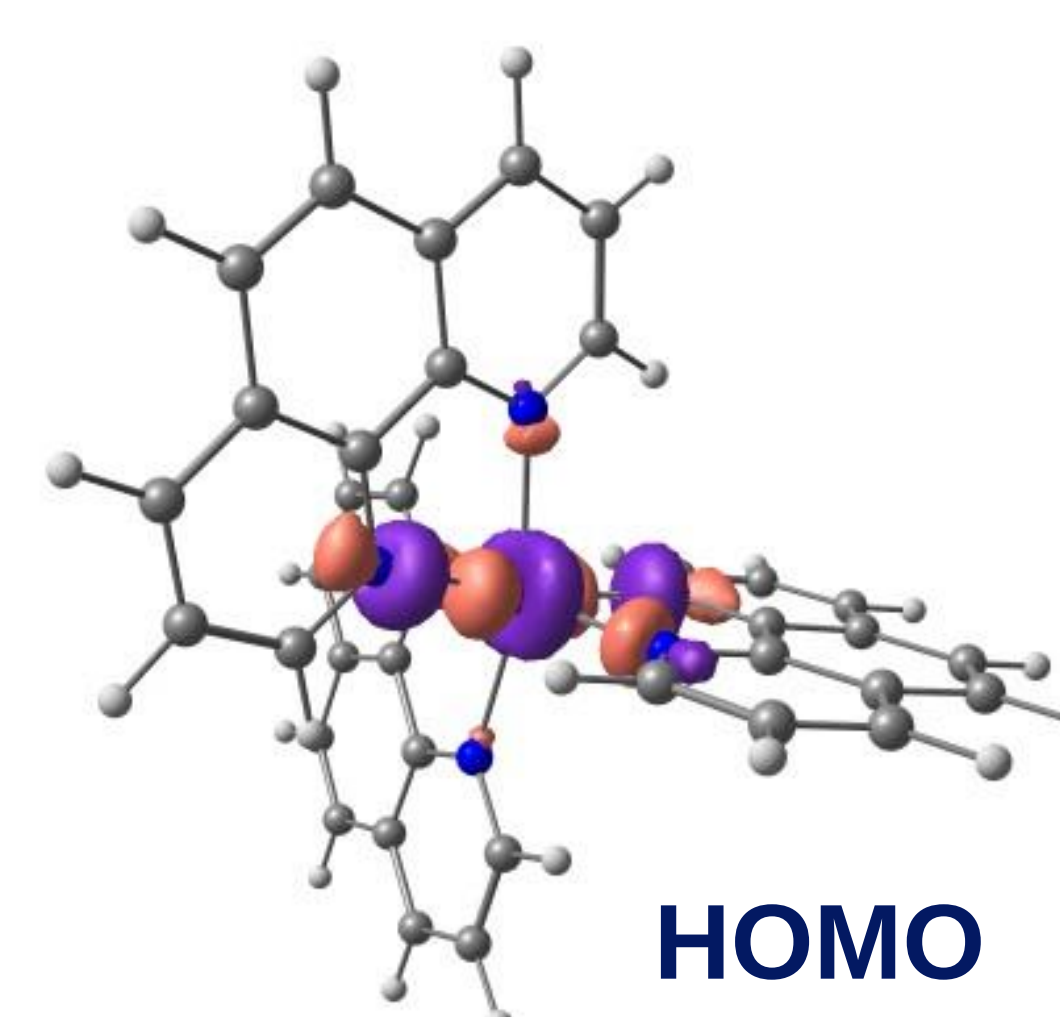
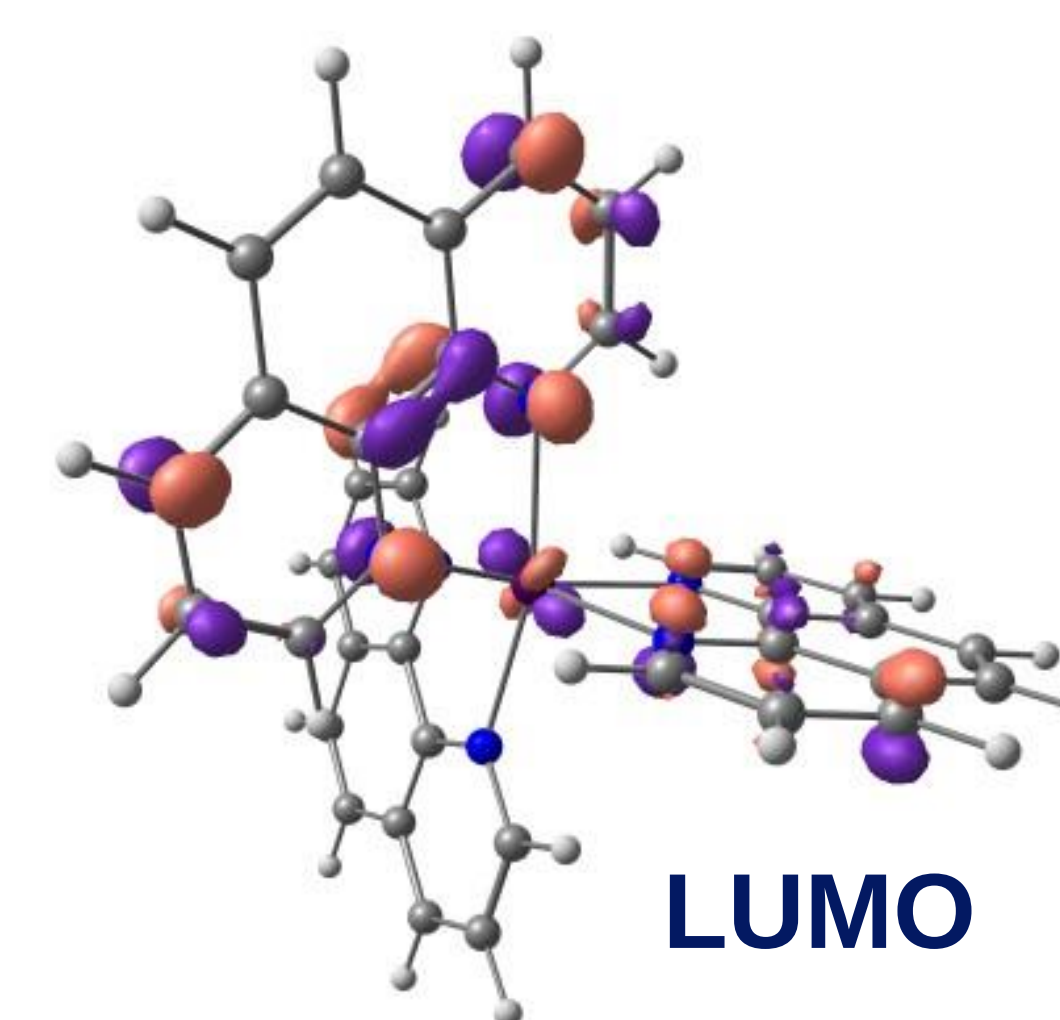
Complexes M = Mn, Fe and Co



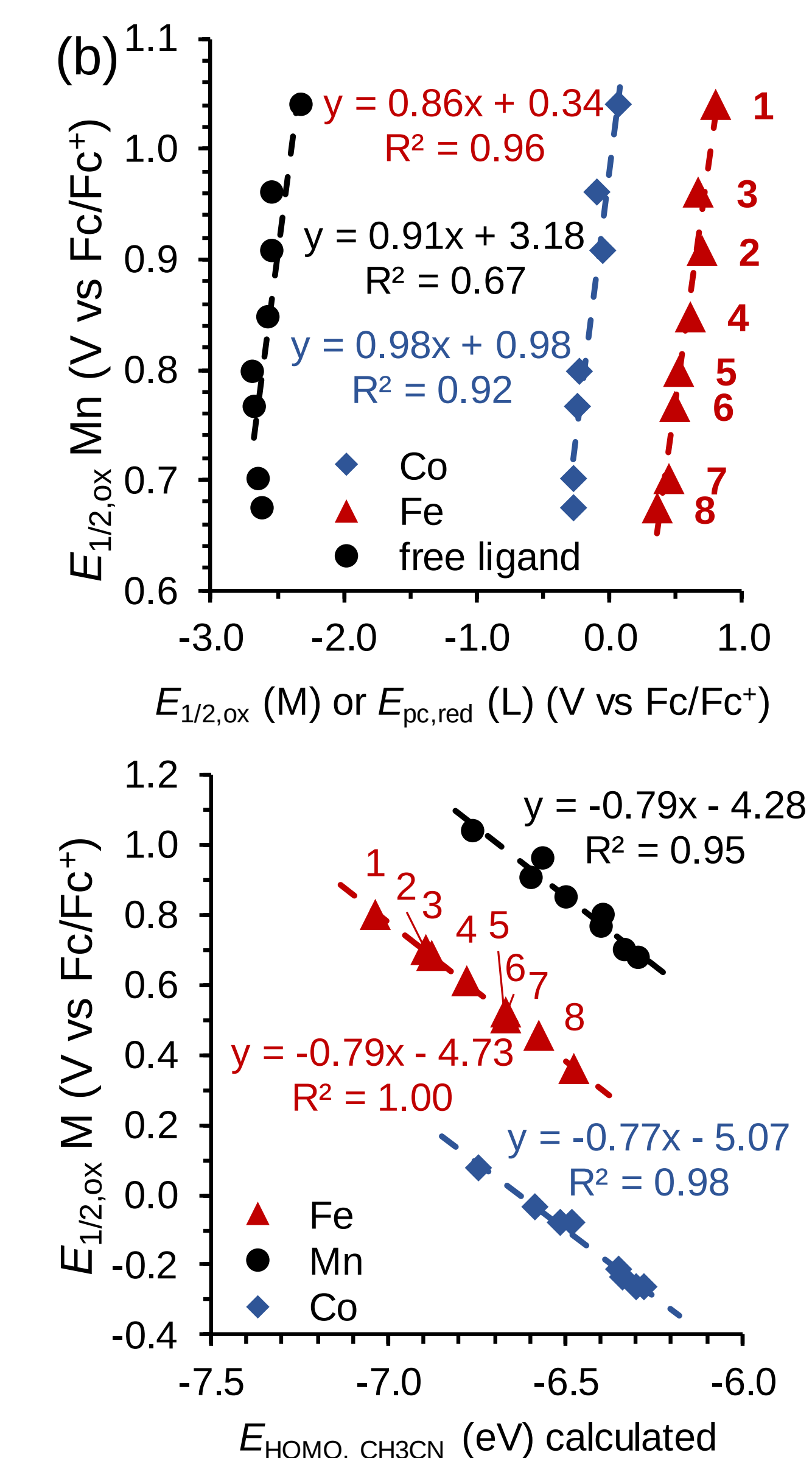
DFT geometry



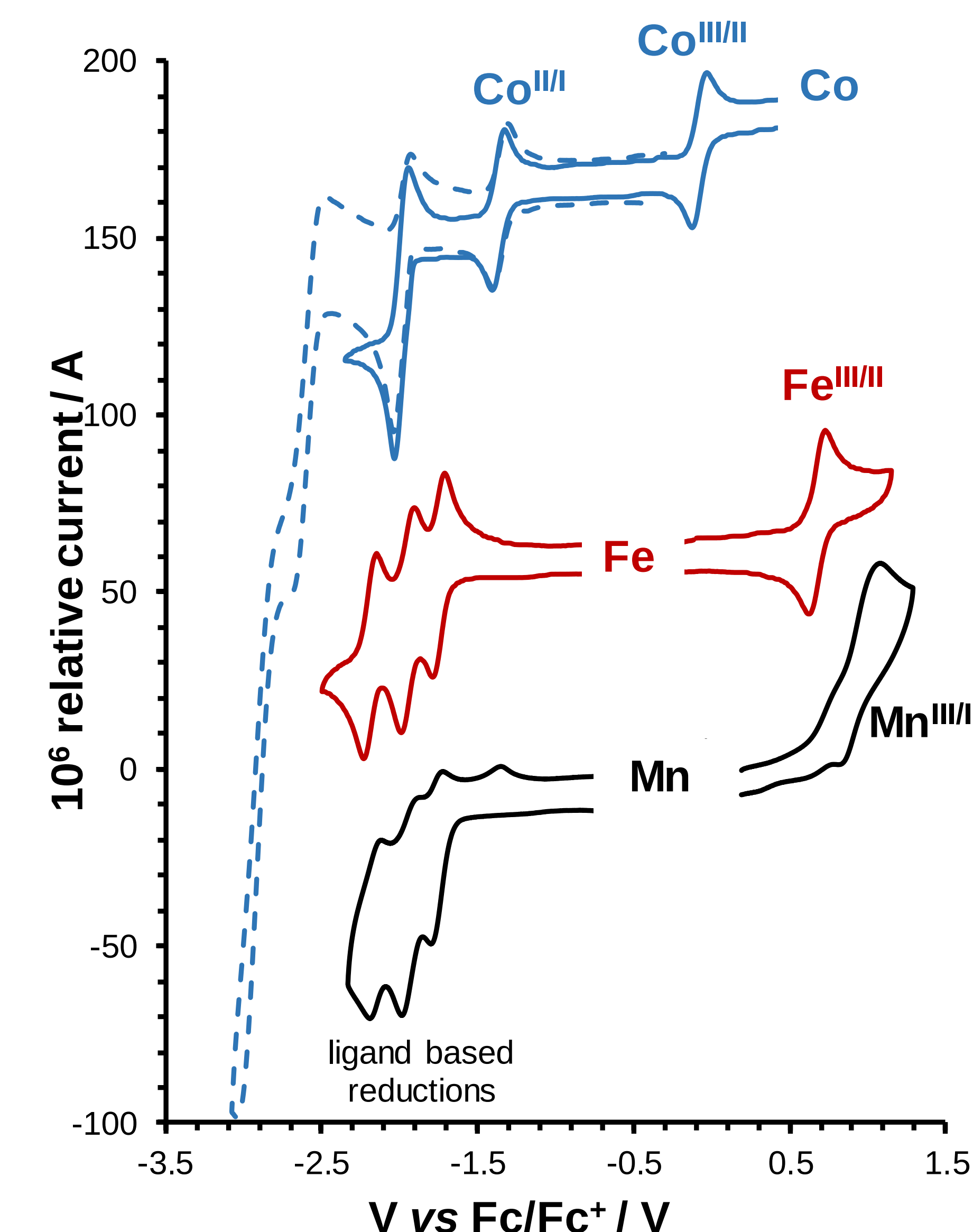
DFT HOMO and LUMO M = Mn(II)



Relationships



CVs



References: Electrochim. Acta. (2021) 138965; Electrochim. Acta. 216 (2016) 339; Electrochim. Acta. 292 (2018) 489; Inorganica Chim. Acta. 486 (2019) 26; Electrochem. Commun. 136 (2022) 107225

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