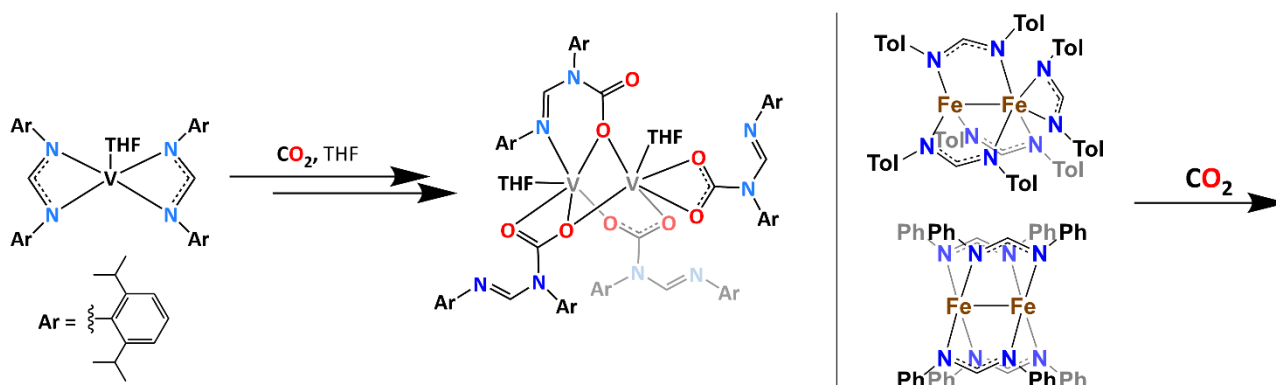


The reactivity of Fe(II) and V(II) formamidinates with CO₂

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In the last two decades, the progress of carbon dioxide activation by transition metal complexes has still grown. The reactivity of metal complexes with carbon dioxide can be generally divided into the insertion of CO₂ into metal-element σ -bond and the reduction of CO₂ on low-valent metal centres. Therefore, we tested the reactivity of CO₂ with Fe(II) and V(II) formamidinates – the low oxidation states prompted redox reactions, but the strong nucleophilicity of formamidinate ligands hampered the redox processes.^[1] Our investigations demonstrated that the examined mononuclear V(II) and Fe(II) bis(formamidinates) were easily N-carboxylated at the M-N amidinate binding site in conjunction with an aggregation of the resulting intermediate species. The effectivity of the examined CO₂ insertion processes strongly depended on the solvent's used character and the metal centre's coordination sphere geometry. Currently, we are extending the investigations, examining binuclear Fe-Fe bonded formamidinate complexes, characterised by us in the very recent paper.^[2] The preliminary studies concerning the reactivity of diiron formamidinates with CO₂ result in the variety of reaction pathways, including CO₂ insertions and the participation of formamidinate ligands in the oxygen abstraction from CO₂. In the presentation, I will detailly present the CO₂ reactivity with mononuclear V(II) and Fe(II) formamidinates and I will show the multimetallic cooperativity in the activation of carbon dioxide by diiron formamidinates.



References

- [1] K. Korona, A. Kornowicz, M. Terlecki, I. Justyniak, A. Błachowski and J. Lewiński, *Chem. Commun.*, submitted.
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