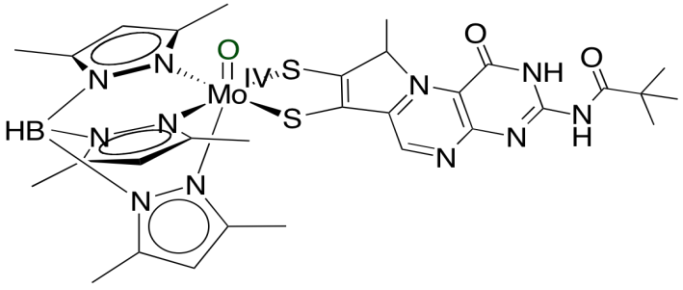
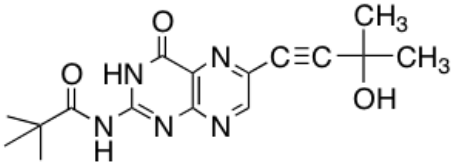
The Effect of One Less Methyl Group in Mo Pterin Dithiolene Chemistry

The molybdenum cofactor is responsible for the activity of essential molybdenum-containing enzymes like sulfur oxidase in all living organisms. Therefore, it is essential to model the cofactor in order to investigate the character of molybdenum pterin dithiolene chemistry. This research project will study the pterin alkyne ligands used to make model pterin dithiolene complexes. The different substituents on the alkyne used to make the model pterin dithiolene complexes change their behavior. BOPP, a variation of the BMOPP alkyne, is identical to BMOPP but lacks a methyl group. When reacted with the Tp* tetrasulfide molybdenum complex, BOPP dithiolenes cyclize into pyrolo pterin species, particularly when water is removed from the reaction. This sets BOPP dithiolenes apart from the better-studied BMOPP dithiolenes, which behave differently to make pyrano pterin species that resemble the molybdenum cofactor. The goal of this research will be to optimize, isolate, and characterize the BOPP dithiolene pyrolo species and to continue to study its behavior as compared to BMOPP dithiolenes. In addition to the BOPP alkyne, other alkynes are being synthesized with different substituents to investigate the reactivity of the complex.

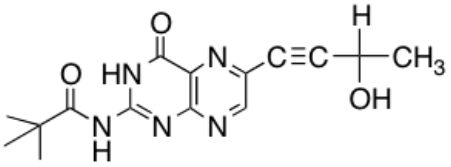


"772" Tp*Mo(O)(pyrolo-S_2BOPP)



BMOPP

2-pivaloyl-6-(2-methyl-3-butyn-2-ol) pterin



BOPP

2-pivaloyl-6-(3-butyn-2-ol) pterin