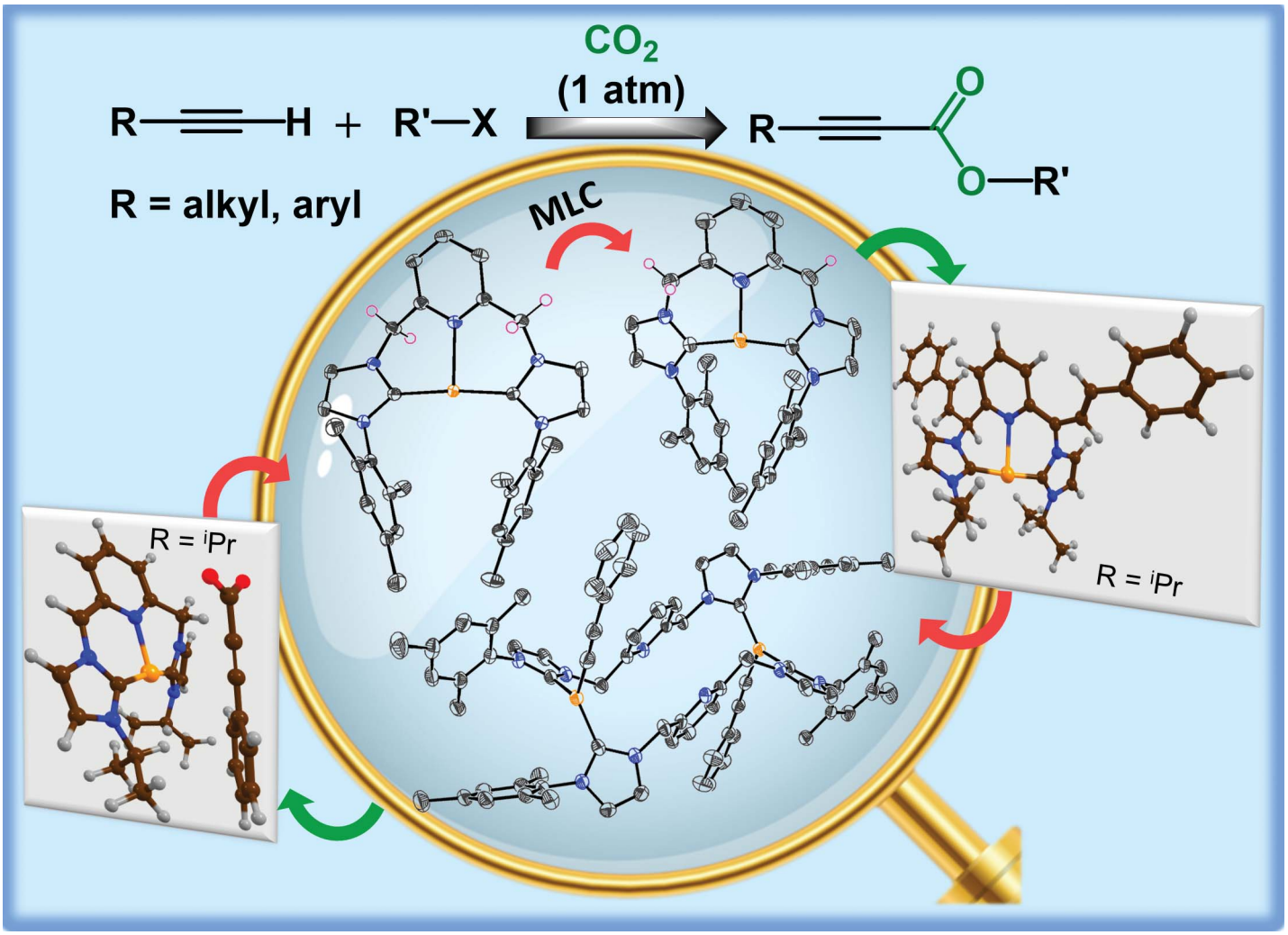

Showcasing research from Professor Laleh Tahsini's laboratory, Oklahoma State University, Oklahoma, USA.

Metal ligand cooperativity in the direct carboxylation and esterification of terminal alkynes by Cu-CNC complexes bearing 2,6-lutidine linkers

This work highlights the first structurally characterized dearomatized Cu-CNC complexes and their application as catalysts for the direct carboxylation of terminal alkynes through the MLC. CO_2 utilization in direct organic synthesis is a significant and emerging field in catalysis. In this work, we report novel molecular Cu-CNC complexes that react with CO_2 and terminal alkynes under atmospheric and sub-atmospheric pressures. While copper-catalyzed carboxylation is not unprecedented, this work presents the first example of metal-ligand-cooperativity (MLC) *via* a dearomatization-aromatization mechanism in the direct carboxylation of terminal alkynes. It also presents the first dearomatized Cu-CNC complexes that have been crystallographically and spectroscopically characterized, and their enthalpy and entropy of formation, as well as the activation parameters, have been determined.

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