

Insights: Publications

Decarbonylative ether dissection by iridium pincer complexes

Chem. Sci., 2020, 11, 12130

September 24, 2020

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A unique chain-rupturing transformation that converts an ether functionality into two hydrocarbyl units and carbon monoxide is reported, mediated by iridium(I) complexes supported by aminophenylphosphinite (NCOP) pincer ligands. The decarbonylation, which involves the cleavage of one C–C bond, one C–O bond, and two C–H bonds, along with formation of two new C–H bonds, was serendipitously discovered upon dehydrochlorination of an iridium(III) complex containing an aza-18-crown-6 ether macrocycle. Intramolecular cleavage of macrocyclic and acyclic ethers was also found in analogous complexes featuring aza-15-crown-5 ether or bis(2-methoxyethyl)amino groups. Intermolecular decarbonylation of cyclic and linear ethers was observed when diethylaminophenylphosphinite iridium(I) dinitrogen or norbornene complexes were employed. Mechanistic studies reveal the nature of key intermediates along a pathway involving initial iridium(I)-mediated double C–H bond activation.

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