

IPr*F – Highly Hindered, Fluorinated N-Heterocyclic Carbenes

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The introduction of fluorine atom has attracted considerable interest in molecular design owing to the high electronegativity and the resulting polarization of carbon–fluorine bonds. Simultaneously, sterically-hindered N-heterocyclic carbenes (NHCs) have received major interest due to high stabilization of the reactive metal centers, which has paved the way for the synthesis of stable and reactive organometallic compounds with broad applications in main group chemistry, inorganic synthesis and transition-metal-catalysis. Herein, we report the first class of sterically-hindered, fluorinated N-heterocyclic carbenes. These ligands feature variable fluorine substitution at the N-aromatic wingtip, permitting to rationally vary steric and electronic characteristics of the carbene center imparted by the fluorine atom. An efficient, one-pot synthesis of fluorinated IPr*F ligands is presented, enabling broad access of academic and industrial researchers to the fluorinated ligands. The evaluation of steric, electron-donating and π -accepting properties as well as coordination chemistry to Au(I), Rh(I) and Se is presented. Considering the unique properties of carbon–fluorine bonds, we anticipate that this novel class of fluorinated carbene ligands will find widespread application in stabilizing reactive metal center.

Słowa kluczowe

N-heterocyclic carbenes, Ligand design, Fluorinated NHCs,
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