

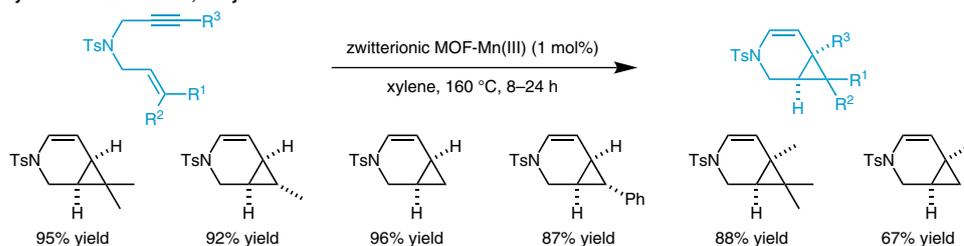
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A New Approach to Non-Coordinating Anions: Lewis Acid Enhancement of Porphyrin Metal Centers in a  
Zwitterionic Metal–Organic Framework

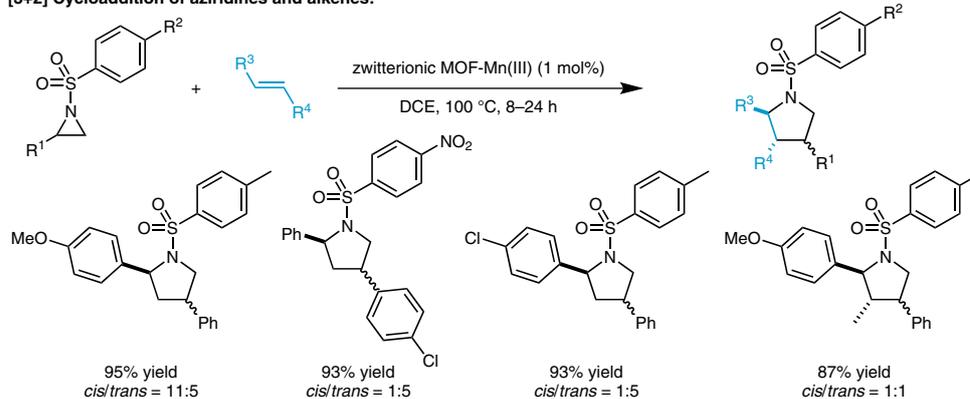
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## Zwitterionic Metal–Organic Frameworks for Lewis Acid Catalysis

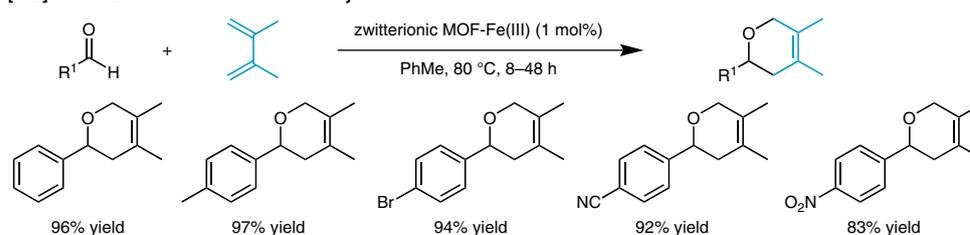
### Cycloisomerization of 1,6-enynes:



### [3+2] Cycloaddition of aziridines and alkenes:



### [4+2] Hetero-Diels–Alder reaction of aldehydes with a diene:



**Significance:** The Mn(III)-catalyzed cycloisomerization of 1,6-enynes and the [3+2] cycloaddition of aziridines with alkenes, as well as the Fe(III)-catalyzed [4+2] hetero-Diels–Alder reaction of aldehydes with a diene were promoted by zwitterionic metal–organic frameworks (MOFs; 1 mol%) with cationic Mn or Fe centers and  $[\text{In}(\text{CO}_2)_4]^-$  secondary building blocks.

**Comment:** Single-crystal X-ray diffraction analysis showed that the cationic Mn(III) and Fe(III) centers in the zwitterionic MOFs were coordinated by  $\text{H}_2\text{O}$ . As a control, the analogous MOFs with  $\text{Cl}^-$  coordinated to the Mn(III) centers were prepared, but these did not promote the cycloisomerization of a 1,6-enyne under similar conditions (<1% yield, 24 h).

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