Immobilization of Rh(I) precursor in a porphyrin metal–organic framework – turning on the catalytic activity.

Autorzy

Anna M. Szczepkowska

Mateusz Janeta

Miłosz Siczek

Włodzimierz Tylus

Anna M. Trzeciak

Wojciech Bury

Rok wydania

2021

Czasopismo

Dalton Transactions

Numer woluminu

50

Strony

9051-9058

DOI

10.1039/d1dt00518a

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

Two model porphyrin metal–organic frameworks were used for the incorporation of Rh(I) species by a post-synthetic metallation under mild conditions. As a result, new rhodium MOFs (Rh/MOFs), **Rh/PCN-222** and **Rh/NU-1102**, were synthesized and structurally characterized. To illustrate the potential of this catalytic platform, we use Rh/MOFs as phosphine-free heterogeneous catalysts in the hydrogenation of unsaturated hydrocarbons under mild reaction conditions (30 °C and 1 atm H_2). We found that for our Rh/MOFs an activation step is required during the first run of the catalytic process. The presence of Rh–CO moieties allowed us to monitor the activation pathway of the catalyst under a H_2 atmosphere, by *in situ* Diffuse Reflectance Infrared Fourier Transform Spectroscopy (DRIFTS). After activation, the catalyst remains highly active during the subsequent catalytic cycles. This simple post-synthetic modification approach presents new possibilities for the utilization of Rh-based catalytic systems with robust porphyrin-based MOFs as supports.

Adres publiczny

http://dx.doi.org/10.1039/d1dt00518a

Strona internetowa wydawcy

https://www.rsc.org/