

## Water-stable zirconium-based metal-organic framework material with high-surface area and gas-storage capacities.

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### Rok wydania

2014

### Czasopismo

Chemistry-A European  
Journal

### Numer woluminu

20

### Strony

12389-12393

### DOI

10.1002/chem.201402895

### Streszczenie

We designed, synthesized, and characterized a new Zr-based metal-organic framework material, NU-1100, with a pore volume of 1.53 ccg<sup>-1</sup> and Brunauer-Emmett-Teller (BET) surface area of 4020 m<sup>2</sup>g<sup>-1</sup>; to our knowledge, currently the highest published for Zr-based MOFs. CH<sub>4</sub>/CO<sub>2</sub>/H<sub>2</sub> adsorption isotherms were obtained over a broad range of pressures and temperatures and are in excellent agreement with the computational predictions. The total hydrogen adsorption at 65 bar and 77 K is 0.092 g g<sup>-1</sup>, which corresponds to 43 g L<sup>-1</sup>. The volumetric and gravimetric methane-storage capacities at 65 bar and 298 K are approximately 180 vSTP/v and 0.27 g g<sup>-1</sup>, respectively.

### Słowa kluczowe

gas storage, hydrogen, metal organic frameworks, methane

### Adres publiczny

<http://dx.doi.org/10.1002/chem.201402895>

### Strona internetowa wydawcy

[onlinelibrary.wiley.com](http://onlinelibrary.wiley.com)

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Plik został wygenerowany dnia 2026-05-02 13:32:22

Adres w repozytorium <https://old.chem.uni.wroc.pl/pl/repozytorium/KSHHouQ>.