Accepted Manuscript

The Insights from X-ray Absorption Spectroscopy into the Local Atomic Structure and Chemical Bonding of Metal-organic Frameworks

Mikhail. A Soldatov, Andrea Martini, Aram L Bugaev, Ilia Pankin, Pavel. V. Medvedev, Alexander A. Guda, Abdelaziz M. Aboraia, Yulia S. Podkovyrina, Andriy P. Budnyk, Alexander A. Soldatov, Carlo Lamberti

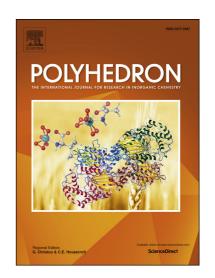
PII: S0277-5387(18)30460-1

DOI: https://doi.org/10.1016/j.poly.2018.08.004

Reference: POLY 13326

To appear in: Polyhedron

Received Date: 25 June 2018 Accepted Date: 4 August 2018



Please cite this article as: Mikhail.A Soldatov, A. Martini, A.L. Bugaev, I. Pankin, Pavel.V. Medvedev, A.A. Guda, A.M. Aboraia, Y.S. Podkovyrina, A.P. Budnyk, A.A. Soldatov, C. Lamberti, The Insights from X-ray Absorption Spectroscopy into the Local Atomic Structure and Chemical Bonding of Metal-organic Frameworks, *Polyhedron* (2018), doi: https://doi.org/10.1016/j.poly.2018.08.004

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

The Insights from X-ray Absorption Spectroscopy into the Local Atomic Structure and Chemical Bonding of Metal-organic Frameworks.

Mikhail. A Soldatov¹, Andrea Martini^{1,2}, Aram L Bugaev¹, Ilia Pankin^{1,2}, Pavel. V. Medvedev¹, Alexander A. Guda¹, Abdelaziz M. Aboraia^{1,4}, Yulia S. Podkovyrina¹, Andriy P. Budnyk¹, Alexander A. Soldatov¹, Carlo Lamberti^{1,3}

¹The Smart Materials Research Institute, Southern Federal University, Sladkova str. 178/24, Rostov-on-Don, Russia

Corresponding author: Mikhail Soldatov mikhail.soldatov@gmail.com

Keywords

Metal-organic Frameworks, X-ray absorption spectroscopy, EXAFS, XANES, operando

Abbreviations

| DOS | Density of States |
|-------|--|
| EXAFS | Extended X-ray Absorption Fine Structure |
| FT | Fourier Transform |
| MII | Materials of Institute Lavoisier |

MIL Materials of Institute Lavoisier MOF Metal-organic Framework

RIXS Resonant Inelastic X-ray Scattering

RMS Root Mean Square

UiO Universitetet i Oslo (University of Oslo)
UPS Ultraviolet Photoelectron Spectroscopy

WT Wavelet Transform

XAFS
 X-ray Absorption Fine Structure
 XANES
 X-ray Absorption Near Edge Structure
 XAS
 X-ray Absorption Spectroscopy
 XES
 X-ray Emission Spectroscopy
 XFEL
 X-ray Free Electron Lasers

XPS X-ray Photoelectron Spectroscopy

XRD X-ray Diffraction

1. Introduction

2. Methods

- 2.1. X-ray Absorption Spectroscopy: general aspects
- 2.2. EXAFS and Wavelet Transform applied in the analysis of EXAFS spectra

3. Local atomic structure and chemical bonding of metal-organic frameworks investigated by XAFS techniques

- 3.1. Designing new efficient catalysts by MOFs functionalization
- 3.2. MOFs as single site catalysts for energy applications
- 3.3. MOFs as photocatalysts: and time-resolved studies
- 3.4. MOFs as materials for gas sorption and storage
- 3.5. MOFs for energy storage

4. Conclusions and perspectives

Acknowledgements

References and Notes

Department of Chemistry and NIS Centre, University of Turin, via P. Giuria 7, Turin, Italy
 Department of Physics, CrisDi and NIS Interdepartmental Centres and INSTM reference center, University of Turin, via Pietro Giuria 1, 10125, Turin, Italy

⁴ Department of Physics, Faculty of Science, Al-Azhar University, Assiut, 71542, Egypt

Download English Version:

https://daneshyari.com/en/article/9953376

Download Persian Version:

https://daneshyari.com/article/9953376

<u>Daneshyari.com</u>