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BOOK OF ABSTRACTS

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International Congress Centre Dresden · Germany

International Conference on Metal-Organic Frameworks and Open Frameworks Compounds

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MOF2022
INTERNATIONAL CONFERENCE ON METAL-ORGANIC FRAMEWORKS AND OPEN FRAMEWORK COMPOUNDS

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M. de Koning[1]; C. Soares[2]; M. van Grol[1]; R. Bross[1]; G. Maurin[2]; [1] TNO Defense, Safety and Security,, Rijswijk/NL; [2] ICGM, Univ. Montpellier, CNRS, ENSCM, Montpellier/F

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P. Liu[1]; [1] Technical University of Munich, Garching/D

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L. Spies[1]; J. Schneider[1]; A. Patrocinio[2]; T. Bein[1]; [1] Ludwig Maximilian Universität München, München/D; [2] Federal University of Uberlandia, Uberlandia/BR

B 2.52 **Potential use of MOFs as catalysts for glycolysis of poly(terephthalate ethylene)**
P. Jutrzenka Trzebiatowska[1]; M. Baluk[2]; A. Zaleska-Medynska[3]; M. Gazda[4]; [1] University of Gdańsk, Gdańsk/PL; [2] University of Gdansk, Gdańsk/PL; [3] University of Gdansk,, Gdańsk/PL; [4] Gdansk University of Technology, Gdańsk/PL

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A. Nambi[1]; [1] DTU, Kongens Lyngby/DK

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S. Mtetwa[1]; E. Lam[1]; D. Fairen-Jimenez[2]; E. Reisner[1]; A. Wheatley[1]; [1] University of Cambridge, Department of Chemistry, Cambridge/UK; [2] University of Cambridge, Department of Chemical Engineering and Biotechnology, Cambridge/UK

B 2.55 **Heterogenized Phosphine Rhodium Molecular Catalyst within Metal-Organic Framework (MOF) for Ethylene Hydroformylation**
P. Samanta[1]; J. Canivet[2]; [1] Institute of research on catalysis and the environment of Lyon, Villeurbanne/F; [2] Institute of research on catalysis and the environment of Lyon, Lyon/F

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L. Shupletsov[1]; S. Amanzadeh Salout[1]; A. Hossain Khan[1]; A. De[1]; I. Senkovska[1]; S. Kaskel[1]; E. Brunner[1]; [1] TU Dresden/D

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P. Länger[1]; J. Senker[1]; [1] Universität Bayreuth, Bayreuth/D

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M. Melero Gutiérrez[1]; F. Llabrés i Xamena[1]; U. Díaz[1]; [1] ITQ (UPV-CSIC), Valencia/E

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S. Oßwald[1]; [1] Karlsruher Institut für Technologie (KIT), Karlsruhe/D

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A. Dominic[1]; Z. Wang[1]; A. Kuc[2]; P. Petkov[3]; H. Ly[1]; T. Pham[4]; M. Kutzschbach[4]; Y. Cao[5]; J. Bachmann[5]; X. Feng[2]; R. Dong[2]; I. Weidinger[2]; [1] Technische Universität Dresden, Dresden/D; [2] Helmholtz- Zentrum Dresden Rossendorf e.V., Dresden/D; [3] University of Sofia, Sofia/BG; [4] Berlin University of Technology, Berlin/D; [5] Friedrich-Alexander-Universität Erlangen Nürnberg, Erlangen/DE, Erlangen/D

B 2.62 **Metal-Phthalocyanine-Based 2D Conjugated MOF Electrocatalysts**
M. Wang[1]; H. Zhong[1]; R. Dong[1]; E. Brunner[1]; S. Kaskel[1]; X. Feng[1]; [1] Technische Universität Dresden, Germany, Dresden/D

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N. Suremann[1]; A. Beiler[1]; B. McCarthy[1]; W. Gschwind[1]; S. Ott[1]; [1] University of Uppsala, Uppsala/S

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A. Stone[1]; J. Hupp[1]; E. Weiss[1]; [1] Northwestern University, Evanston/USA

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C. Byrne[1]; N. Zabukovec Logar[1]; [1] National Institute of Chemistry, Ljubljana/SLO

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M. Suyetin[1]; [1] Institute of Nanotechnology, Karlsruhe Institute of Technology., Eggenstein-Leopoldshafen, Germany/D

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M. Soukri[1]; D. O'Nolan[1]; [1] RTI International, Durham/USA

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S. Peh[1]; [1] National University of Singapore, Singapore/SGP

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E. Andres-Garcia[1]; M. Clemente-León[1]; G. Mínguez Espallargas[1]; [1] Instituto de Ciencia Molecular (ICMol), Universitat de Valencia, Paterna/E

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M. Karimi[1]; A. Rodrigues[1]; A. Ferreira[1]; F. Nouar[2]; K. Cho[3]; U. Lee[3]; C. Serre[2]; J. Silva[4]; [1] University of Porto, Porto/P; [2] Institut des Matériaux Poreux de Paris, CNRS, Ecole Normale Supérieure, PSL University, Paris/F; [3] Korea Research Institute of Chemical Technology, Gajeong-ro/ROK; [4] b Centro de Investigação de Montanha, Bragança/P

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P. Napolitano-Tabares[1]; A. Gutiérrez-Serpa[2]; A. Jiménez-Abizanda[1]; F. Jiménez-Moreno[1]; J. Pasán[1]; V. Pino[1]; [1] Universidad de La Laguna, San Cristóbal de La Laguna/E; [2] Technische Universität Dresden, Dresden/D

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R. González-Martín[1]; P. Pachfule[2]; D. Díaz Díaz[3]; V. Pino[3]; [1] Universidad de La Laguna, San Cristóbal de La Laguna/E; [2] Department of Chemical, Biological & Macro-Molecular Sciences, S. N. Bose National Centre for Basic Sciences, Kolkata/IND; [3] Universidad de La Laguna, San Cristóbal de La Laguna/E

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I. Taima-Mancera[1]; J. Ayala[1]; J. Pasán[1]; V. Pino[1]; [1] Universidad de La Laguna, San Cristóbal de La Laguna/E

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E. Lodoso-Ruiz[1]; M. Trujillo-Rodríguez[1]; J. Pasán[1]; J. Ayala[1]; V. Pino[1]; [1] Universidad de La Laguna, San Cristóbal de La Laguna/E

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N. R G[1]; A. Chandiran[1]; N. Kaisare[1]; [1] Indian Institute of Technology Madras, Chennai/IND

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N. Eden[1]; [1] Monash University, Research Way, Clayton/AUS

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J. Roth[1]; [1] EPFL Valais, sion/CH

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J. Güllich[1]; J. Senker[1]; [1] Universität Bayreuth, Bayreuth/D

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A. Díaz-Durán[1]; G. Iadarola-Pérez[2]; F. Viva[1]; F. Roncaroli[3]; [1] National Scientific and Technical Research Council, San Martin - Buenos Aires/RA; [2] University of Buenos Aires, Ciudad de Buenos Aires/RA; [3] National Scientific and Technical Research Council, San Martin - Buenos Aires/RA

B 2.106 **MOFs based on pyrazolone connectors for the dye adsorption**
C. Jiménez[1]; G. Ripoll[2]; P. Hidalgo[2]; J. Belmar[2]; B. Urbano[2]; J. Pasán[3]; [1] Universidad de Concepcion, Concepcion/RCH; [2] Universidad de Concepción, Concepcion/RCH; [3] Universidad de La Laguna, La Laguna, Tenerife/E

B 2.107 **Sulfonic-functionalized MIL-100 for enhanced removal of pharmaceutical products from water**
N. Crespí Sánchez[1]; G. Turnes Palomino[1]; C. Palomino Cabello[1]; [1] University of the Balearic Islands, Palma (Illes Balears)/E

B 2.108 **MIL-100@carbon hybrid magnetic material for the removal of organic pollutants**
M. del Rio Clar[1]; I. Pascual Massip[1]; G. Turnes Palomino[1]; C. Palomino Cabello[2]; [1] University of the Balearic Islands, Palma/E; [2] University of the Balearic Islands, Palma /E

B 2.109 **Functionalized MIL-101 MOFs as efficient adsorbents for paraquat herbicide**
N. Crespí Sánchez[1]; C. Palomino Cabello[1]; G. Turnes Palomino[1]; [1] University of the Balearic Islands, Palma de Mallorca/E

B 2.110 **Cation-exchange in MOFs: Structure-CO_2 capture and conversion property relationship**
M. Mazaj[1]; A. Krajnc[1]; N. Vrtovec[1]; N. Zabukovec Logar[1]; [1] National Institute of Chemistry, 1000 Ljubljana/SLO

B 2.111 **Novel magnetic hybrid carbon-MOF for diclofenac sodium removal**
M. Bauza[1]; G. Turnes Palomino[1]; C. Palomino Cabello[1]; [1] University of the Balearic Islands, Palma/E

B 2.112 **Synthesis and characterizations of Bacteria and Metal-Organic Frameworks based biohybrids**
A. Permyakova[1]; I. Christodoulou[1]; E. Gkaniatsou[1]; N. Steunou[1]; T. Coradin[2]; F. Fernandes[2]; C. Sicard[1]; [1] Universite de Versailles Saint-Quentin-en-Yvelines, Versailles/F; [2] Sorbonne Université, CNRS, Collège de France, Laboratoire de Chimie de la Matière Condensée de Paris, Paris/F

B 2.113 **Passive 3D MOF-derived-carbon sampler for estrogen extraction**
A. Figuerola[1]; S. Mendiola-Alvarez[2]; L. Hinojosa-Reyes[2]; C. Palomino[1]; G. Turnes[1]; [1] University of Balearic Islands, Palma/E; [2] Universidad Autónoma de Nuevo León, Nuevo León/MEX

Separation of CO_2/N_2 Mixture by Pressure Swing Adsorption Process using Shaped MI-160(Al) for CO_2 Post-Combustion Capture

M. Karimi[1,2,3], A. E. Rodrigues[1,2], A. Ferreira[1,2], F. Nouar[4], K.H. Cho[5], U.H. Lee[5], C. Serre[4], , J. A. Silva[3]

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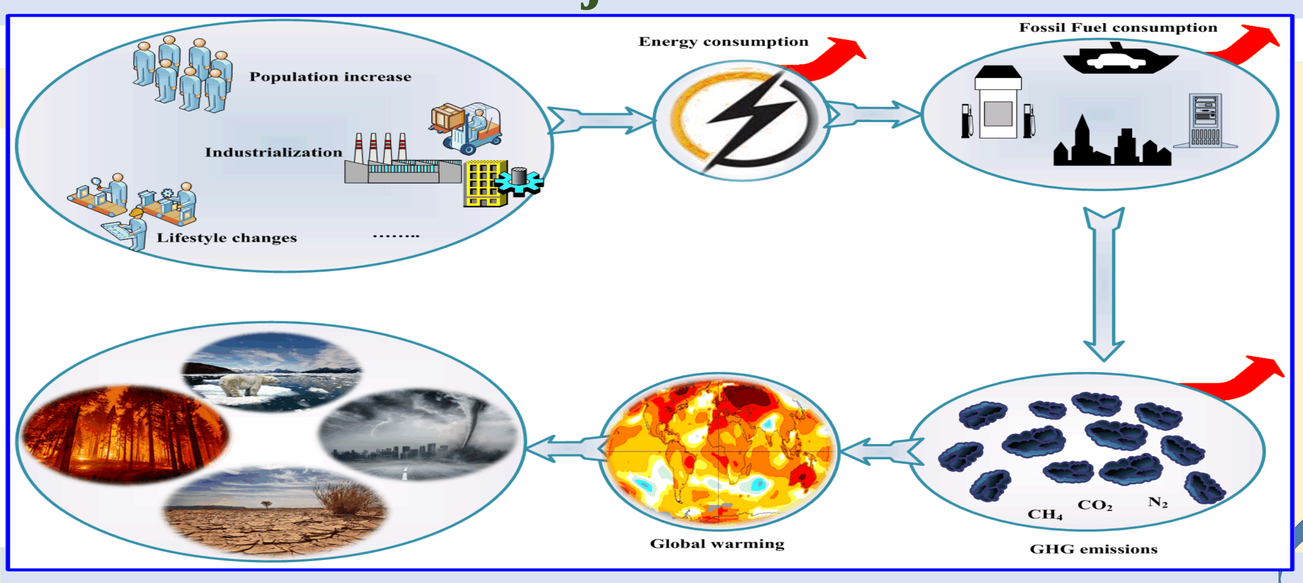
Motivations and Objectives:



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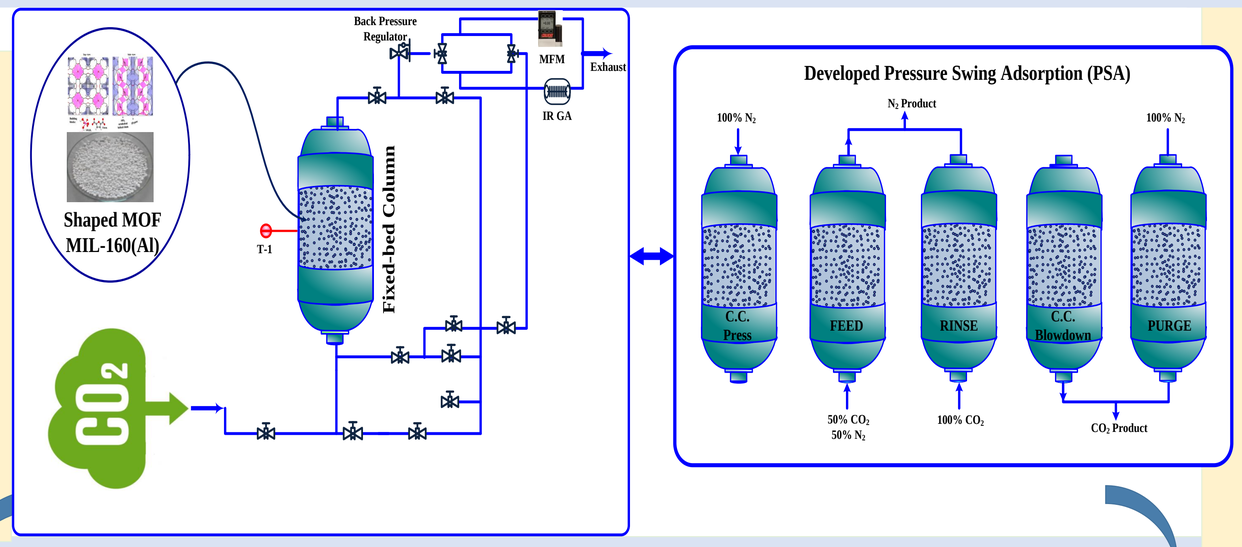

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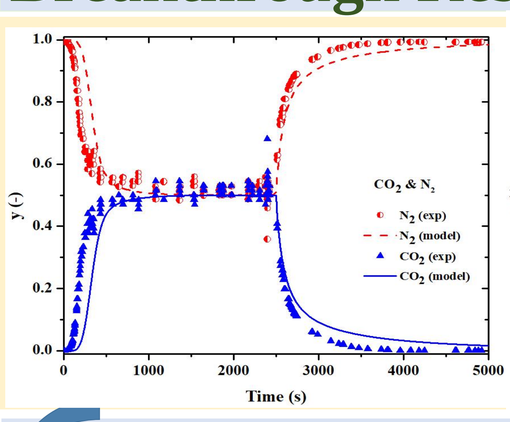
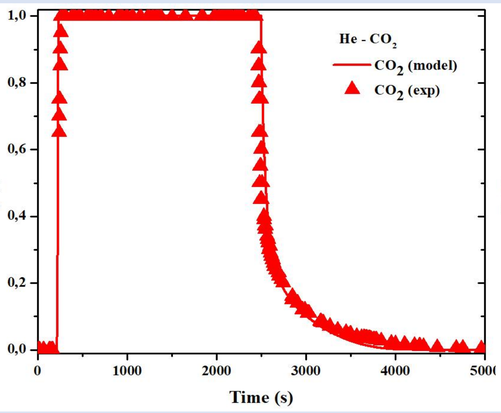
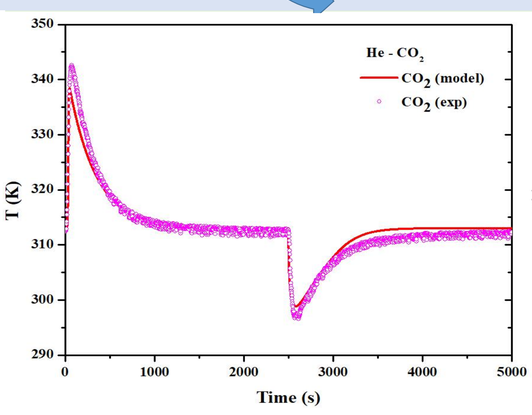
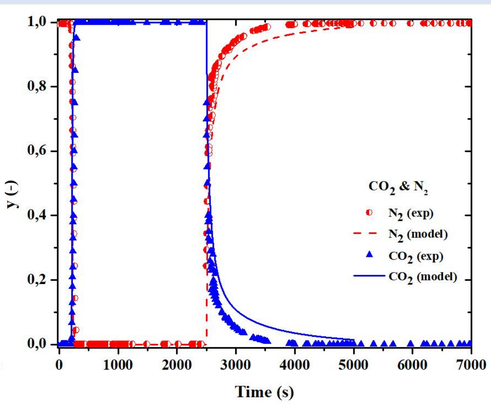
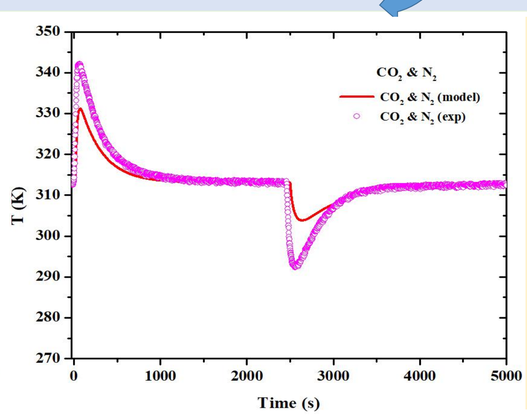


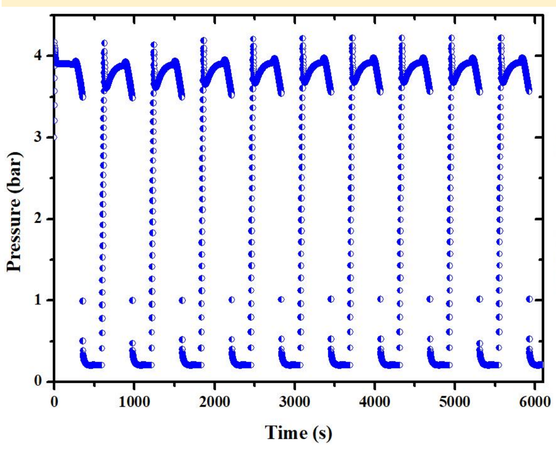


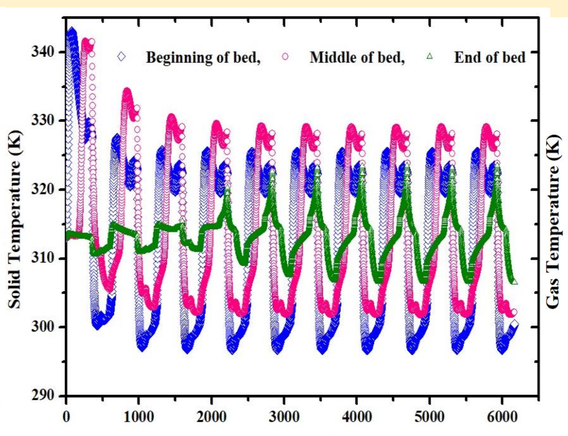


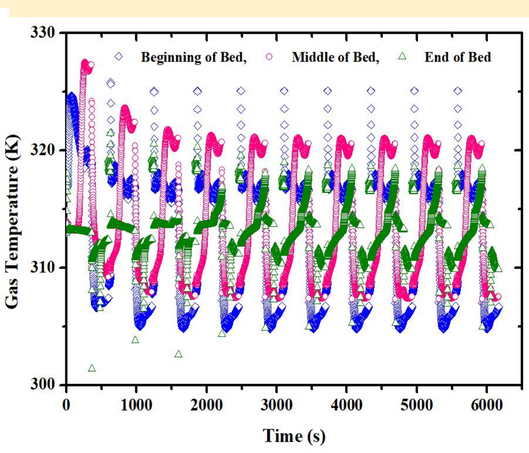


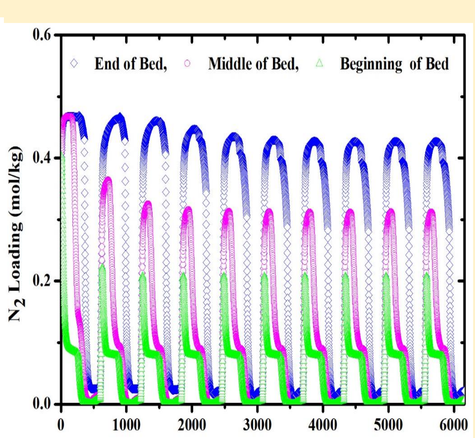


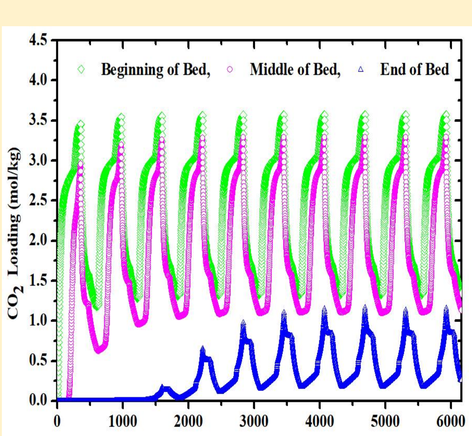
PSA Results:





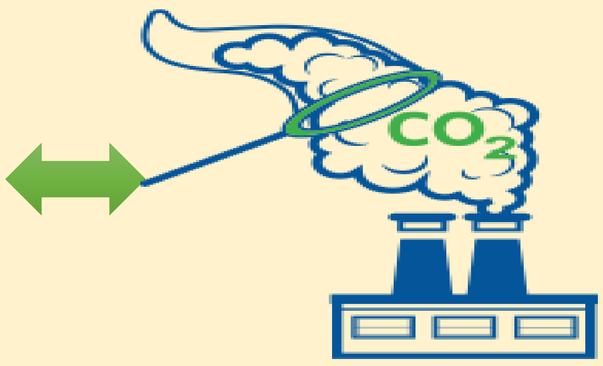






Remarkable outcomes:

Evaluation of Developed PSA		
	Purity (%)	Recovery (%)
CO_2	88%	100%
N_2	98%	80%



Conclusion:

- ✓ Breakthrough experiments were properly simulated with ASPEN ADSIM.
- ✓ Cyclic steady state were developed after 10 cycles.
- ✓ Shaped MOF MIL-160(Al) showed and excellent capacity for Post-combustion CO_2 Capture.
- ✓ Life cycle assessment (LCA) of MIL-160 for Post-combustion CO_2 Capture can be considered as a future direction.

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Separation of CO_2/N_2 Mixture by Pressure Swing Adsorption Process using Shaped MI-160(Al) for CO_2 Post-Combustion Capture

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Increasing rate of greenhouse gases (GHGs) emissions, has led to propel the earth temperature towards higher levels and consequently, the global climate change, which adversely affects the human normal life [1]. Among GHGs, CO_2 is the main contributor of global warming with the emission share of nearly 76% [2]. Also, around 80% of released CO_2 in the earth's atmosphere has been emitted through fossil fuels consumption, which its value is estimated almost 32 Gt emission per year [1, 2]. Accordingly, CO_2 post-combustion capture is a crucial issue regarding the environmental protection [1,2].

In this study, a hydrothermally stable Al-based MOF MIL-160(Al), made under scalable green conditions in shaped form, is being studied experimentally for CO_2 post-combustion capture [3, 4]. This MOF is constructed from aluminum hydroxide chains linked via a five-membered ring 2,5-furan dicarboxylate ligand delimiting 1D microporous channels of 5-6Å. Its technico-economic cost production analysis has been recently assessed [5]. The breakthrough experiments regarding the adsorption of carbon dioxide and nitrogen, also the selectivity of CO_2 concerning N_2 have already been accomplished, which reveal a promising capacity of this sorbent for post-combustion process (as shown in Figure 1). Accordingly, based on the breakthrough data Pressure Swing Adsorption (PSA) experiments are also being performed to

evaluate the cyclic operation performance to use the shaped MIL-160(Al) in PCC and BU strategies in an end engineering perspective processes.

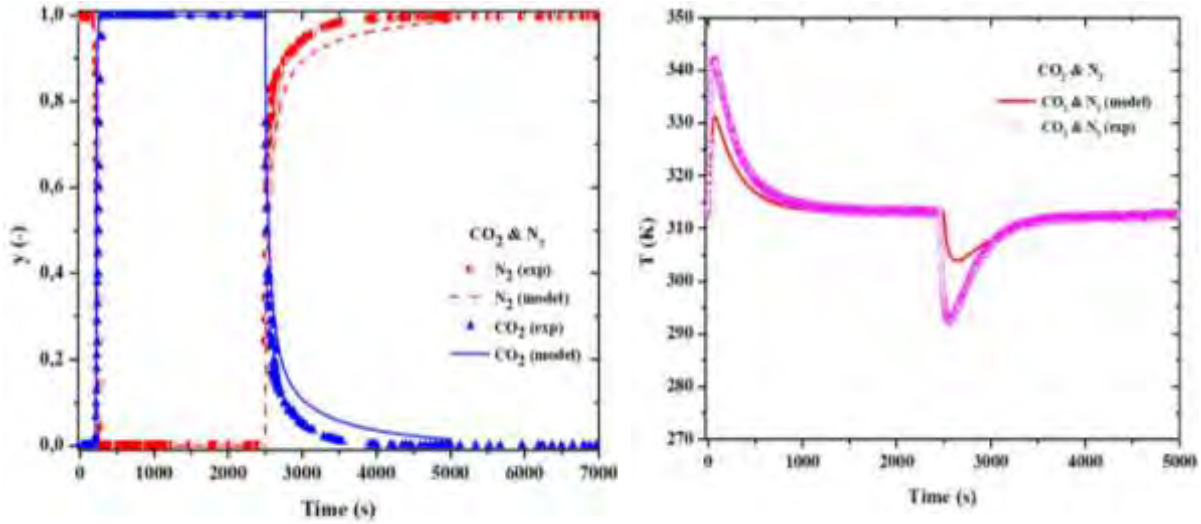

Figure 1: Adsorption of carbon dioxide and nitrogen at 313 K and 3 bar on shaped MIL-160(Al).

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