

A microporous metal-organic framework for separation of CO₂/N₂ and CO₂/CH₄ by fixed-bed adsorption



Author(s): [Bastin L](#) (Bastin, Laurent)², [Barcia PS](#) (Barcia, Patrick S.)², [Hurtado EJ](#) (Hurtado, Eric J.)¹, [Silva JAC](#) (Silva, Jose A. C.)², [Rodrigues AE](#) (Rodrigues, Alirio E.)³, [Chen B](#) (Chen, Banglin)¹ Source: JOURNAL OF PHYSICAL CHEMISTRY C Volume: 112 Issue: 5 Pages: 1575-1581 Published: FEB 7 2008 Times Cited: [84](#) References: [57](#) [Citation Map](#) Abstract: A microporous MOF Zn(BDC)(4,4'-Bipy)0.5 (MOF-508b, BDC = 1,4-benzenedicarboxylate, 4,4'-Bipy = 4,4'-bipyridine) was examined for the separation and removal of CO₂ from its binary CO₂/N₂ and CO₂/CH₄ and ternary CO₂/CH₄/N₂ mixtures by fixed-bed adsorption. With one-dimensional pores of about 4.0 x 4.0 angstrom to induce their differential interactions with the three components, MOF-508b exhibits highly selective adsorption to CO₂ with the,adsorption capacity of 26.0 wt % at 303 K and 4.5 bar. This is the first example of microporous MOFs for the separation and removal of CO₂ from its binary and ternary mixtures by fixed-bed adsorption, establishing the feasibility of the emerging microporous MOFs for their potential. applications in this very important industrial and environmental process. Document Type: Article Language: English KeyWords Plus: SELECTIVE GAS-ADSORPTION; MONTE-CARLO-SIMULATION; CARBON-DIOXIDE; MOLECULAR SIMULATION; SORPTION PROPERTIES; HEXANE ISOMERS; COORDINATION POLYMERS; MIXTURE ADSORPTION; C-168 SCHWARZITE; ACTIVATED CARBON Reprint Address: Chen, B (reprint author), Univ Texas Pan Amer, Dept Chem, Edinburg, TX 78541 USA Addresses:

1. Univ Texas Pan Amer, Dept Chem, Edinburg, TX 78541 USA
2. Escola Sup Tecnol Gestao, Inst Politecn Braganca, P-5301857 Braganca, Portugal
3. Univ Porto, Fac Engn, Dept Engn Quim, Lab Separat React Engn, P-4200465 Oporto, Portugal E-mail Addresses: banglin@utpa.edu Publisher: AMER CHEMICAL SOC, 1155 16TH ST, NW, WASHINGTON, DC 20036 USA Subject Category: Chemistry, Physical; Nanoscience & Nanotechnology; Materials Science, Multidisciplinary IDS Number: 257QY ISSN: 1932-7447 DOI: 10.1021/jp077618g