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Bioactivities of porous 3D Cu-MOF containing flexible ligands and its application to silicone

Do Nam Lee[1], Hyun-Chul Kim[2], Seong Huh[2], Sung-Jin Kim[3] and **Youngmee Kim[3]**

[1]Kwangwoon University, South Korea
[2]Hankuk University of Foreign Studies, South Korea
[3]Ewha Womans University, South Korea

Porous three-dimensional Cu-MOF representing antibacterial effect as well as high selective gas sorption was synthesized by hydrothermal reaction. Bioactive Cu-MOF containing Cu_2 dinuclear units connected by flexible glutarate and 1,2-bis(4-pyridyl)ethane ligands is formulated as $[Cu_2(Glu)\ 2(\mu\text{-bpa})]\cdot 3(H_2O)$ (Glu = glutarate, bpa = 1, 2-bis(4-pyridyl)ethane), and was crystallize in monoclinic space group (C_2/c). The single crystal x-ray study showed that Cu-MOF contains paddle-wheel Cu_2 dinuclear units connected by glutarates to form two-dimensional (2D) sheets, and these sheets were bridged by 1, 2-bis(4-pyridyl) ethane ligand to form three-dimensional (3D) frameworks. The number of solvent water molecules in MOF was calculated from elemental analysis and TGA. The solvent-free Cu-MOF has 28.3% of void volumes based on the PLATON analysis and contain well-defined 1D channels. Porous 3D Cu-MOF exhibited high selective sorption of quadrupolar CO_2 over N_2 and H_2. Antibacterial activities of Cu-MOF applied on the silicone against E.coli, S. Aureus, and MRSA will be discussed.

Biography

Do Nam Lee received her BS and MS from Yonsei University in Chemistry. She earned her PhD from Yonsei University in 1992 under the supervision of Prof. Chang Hwan Kim and completed Postdoctoral study as a member of the groups of Prof. Robert West at University of Wisconsin-Madison. She worked as visiting scholar at Peking University. She is currently an Associate Professor at Kwangwoon University, Republic of Korea and mostly focusing on researches of synthesis and application of coordination complexes, functional metal organic frameworks, and silicone rubber.

donamlee@hanmail.net