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Biological Application of Porous 3D Cu-MOF Connected by Glutarate and 1,2-Bis(4-pyridyl)ethane Ligand

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Metal-organic frameworks (MOFs) can be utilized as antibacterial agents due to their effective antibacterial activities. Three-dimensional (3D) Cu-MOFs were synthesized by hydrothermal reactions or modified literature methods to increase their stabilities in aqueous solution. Porous three-dimensional Cu-MOF represents antibacterial effect as well as high selective gas sorption. 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 (*C2/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. Porous 3D Cu-MOF exhibited high selective sorption of quadrupolar CO_2 over N_2 and H_2. Robust Cu MOF exhibited excellent antibacterial activities with very low MBC value, 20mg/mL against all used strains of bacteria. However, the bactericidal rates of Cu-MOF applied on the silicone rubber against *E.coli, S. aureus* and *MRSA* were observed differently such as 88.6%, 88.7% and 81.5% on the same concentration, respectively.

Biography:

Do Nam Lee received her B.S. and M.S. from Yonsei University in Chemistry. She earned her Ph.D from Yonsei University (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 also worked as visiting scholar at Peking University and LG electric company (Korea). She is currently an Associate Professor at Kwangwoon University, Republic of Korea and mostly focusing on researches of synthesis and application of coordination comlpexes, functional metal organic frameworks and bioactive polymers.