# Modified zirconium-based metal organic framework by 4-aminobenzoic acid to enhance $co_2$ adsorption performance

Le Van Nhieu, 김진수[1,†]
경희대학교; [1]경희대 학교
(jkim21@khu.ac.kr[†])

Zr-based MOF (UiO-66) is known as a leading candidate of adsorbents applied for gas separation process due to high surface area, easily tuned porous properties; chemical surface and diversity in synthesis method. In compared to other MOF-type, however, UiO-66 shows $CO_2$ capture capacity modestly. Therefore, UiO-66 material should be modified its characterization to improve $CO_2$ adsorption capacity. In this work, modified UiO-66 was prepared in one step synthesis between $ZrCl_4$ and linker mixed by terephthalic acid and 4-aminobenzoic acid (ABA) systematically. The presence of ABA in reaction system induced missing-linker defects, simultaneously appearance of $NH_2$ groups in framework, causing to improve $CO_2$ capture capacity. The obtained materials were analysed by SEM, XRD, FTIR, XPS and TGA. The adsorption isotherms of $CO_2$ and $N_2$ on as-prepared adsorbents were recored at 298 K. The results showed that UiO-66#10-$NH_2$ showed a $CO_2$ uptake amount of 2.1 mmol/g, which is higher than that of UiO-66 about 45%. Also, the $CO_2/N_2$ selectivities based on ideal adsorbed solution theory (IAST) and isosteric heat of adsorption were investigated to evaluate gas separation performance of adsorbents