

Gas Sorption Analysis Using Micro-resonators and Flashlight based Material Synthesis

임창용[†]

경북대학교 나노소재공학부

(cy.yim@knu.ac.kr[†])

Metal-organic frameworks (MOFs) are emerging organic-inorganic hybrid crystalline materials containing central metal ions linked by organic ligands. The chemical functionalities and porosity of MOFs can be easily tailored by tuning the central metal ions and organic ligands, thereby creating materials that are useful in traditional applications such as gas storage, gas separation, and heterogeneous catalysis, as well as in chemical vapor sensing applications. Herein, various MOFs were grown on microresonators, such as microcantilevers and quartz crystal microbalances by direct conversion method. The highly sensitive microresonators provided fast sorption kinetics and quantitative measurement of the gas sorption on MOFs-grown resonators. Also, flashlight based various nanoparticle and structure fabrication strategies are introduced. Flashlight technique is emerging method for processing metal nanoparticles to fabricate conductive electrodes. The high power of flashlight can sinter metal nanoparticles with preventing thermal oxidation due to its very short response time (~6 milliseconds). The fabrication technique of conductive electrodes and MOF is investigated.