

Post-synthetic modification and hybridization of NH_2 -UO-66 for drug delivery system

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Metal organic frameworks (MOFs) are a class of porous materials comprised of various organic linkers and various metal ions or cluster. MOFs have many attractive properties such as crystallinity, extremely high surface area and porosity, tunable pore size, easy and various functionalization. In recent decades, MOFs gets great interest in various applications including drug delivery. Herein, we developed a synthetic method to synthesize, modify, and hybridize the zirconium-based MOF, NH_2 -UO-66, nanoparticles for drug delivery. We modified the as-prepared MOF nanoparticles with poly(acrylic acid) (PAA) and loaded an anticancer, 5-flourouracil (5-Fu), into the MOFs in one spot. In assistance of carboxylic group of PAA, we hybridized the modified and drug-loaded MOFs with calcium phosphate (CaP) through mineralization on the nanoparticles. The protecting CaP can help the pH-responsive release of the drug in acidic cancer condition. We envision the release from hybridized MOFs depending on time and pH condition. Studies of NH_2 -UO-66 nanocrystals, their functionalized CaP-hybridized forms as well as the comparisons of their drug loading and delivery efficiencies will be discussed.