Poster Presentation

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Nanoscaled zinc pyrazolate metal-organic frameworks as drug-delivery systems

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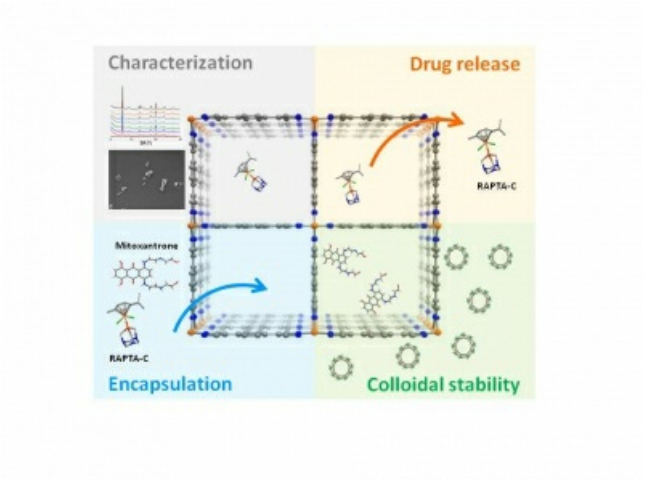
In recent years, there has been a growing interest in the design of new nanometric materials as carriers of challenging therapeutic agents. In this regard, Metal-Organic Frameworks (MOFs) at the nanometric scale (nanoMOFs), have emerged as promising materials for biomedical applications because of their exceptional porosity and highly tunable structure and composition.[1] Considering the above, this work describes the optimization of the synthesis of nanoparticles of the isoreticular MOF ZnBDP_X series, based on the assembly of Zn(II) metal ions and the functionalized organic spacers 1,4-bis(1Hpyrazol-4-yl)-2-X-benzene, where X = H, NO2, NH2 and OH. [2] Furthermore, the physicochemical properties of nanoMOFs must be carefully analyzed prior to their application, since these properties will determine the efficiency and distribution of nanoparticles in the physiological media. In this context, we have investigated the structural and colloidal stability of these nanoMOFs under simulated biological conditions (oral and intravenous). Moreover, we studied the incorporation/desorption of two antitumor drugs mitoxantrone and [Ru(p-cymene)Cl2(pta)] RAPTA-C where pta = 1,3,5-triaza-7-phospaadamantane in the ZnBDP_X series as a proof of concept of the effect of the framework functionalization on the incorporation/delivery of these bioactive molecules.

[1] Horcajada, P., et al. (2010). Nature, 9, 172-178.

[2] Rojas, S., et al. (2016). Inorg. Chem., 55, 2650-2663.



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