

Nalidixic acid-Ca(II) derivatives: discrete complexes and metal-organic frameworks

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Metal-organic frameworks (MOFs) have been used for many different applications over the last decades. Taking advantage of their resourcefulness, we have been exploring the possibility of designing MOFs using nalidixic acid as linker towards enhanced antibacterial activity. Nalidixic acid is a synthetic quinolone antibiotic used for the treatment of urinary tract infections caused by gram-negative microorganisms. We have already demonstrated that the direct coordination of this antibiotic to biocompatible metals, yielding what we call antibiotic coordination frameworks (ACFs), is a viable pathway to induce changes in important properties such as solubility. One further advantage is that synergistic effects of the metal often lead to an increase in the efficiency against different bacteria, including *E. Coli*. [1]

Herein we disclose a nalidixic acid-Ca(II) complex and a three new MOFs resulting from the coordination of nalidixic acid and other generally regarded as safe organic ligands (such as salicylic, nicotinic and isonicotinic acids) to Ca(II) centers. The novel compounds were synthesized by mechanochemistry, [2] ensuring the sustainability of the synthetic process. These new structures offer multiple possibilities for future applications arising from the combination of the antimicrobial activity of the ligand and the calcium important role in the human body.

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