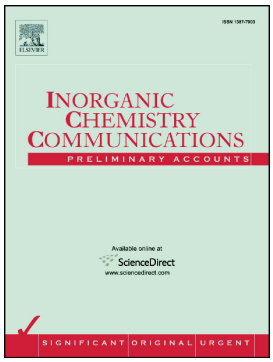

Fe(III) and Cu(I) based metal organic gels for in situ drug loading and drug delivery of 5-fluorouracil

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PII: S1387-7003(18)30262-4
DOI: doi:10.1016/j.inoche.2018.04.028
Reference: INOCHE 6959

To appear in: *Inorganic Chemistry Communications*

Received date: 28 March 2018
Revised date: 26 April 2018
Accepted date: 26 April 2018

Please cite this article as: Darsi Rambabu, Priyanka Negi, Abhimanew Dhir, Ankush Gupta, Pooja , Fe(III) and Cu(I) based metal organic gels for in situ drug loading and drug delivery of 5-fluorouracil. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Inoche(2017), doi:10.1016/j.inoche.2018.04.028

Fe(III) and Cu(I) based metal organic gels for in situ drug loading and drug delivery of 5-fluorouracil

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Abstract: We report anticancer drug, 5-fluorouracil (5FU) loaded Iron(III)-fumaric acid (IN.FA@5FU) and Copper(I)-thiourea (CuTu@5FU) metal organic gels (MOGs). These 5FU loaded MOGs are synthesized by in-situ process at ambient conditions. The cumulative release of the loaded anticancer drug 5FU was investigated at pH 5 and physiological pH 7.4. Present studies have shown that the drug release was high at pH 5 compared to pH 7.4. Compared to IN.FA@5FU the drug release of CuTu@5FU is significantly less at pH 5. Due to high 5FU release at acidic pH, the IN.FA@5FU has more advantage than the CuTu@5FU to the treatment of cancer cells. The promising results of in-situ drug loading in the MOGs and drug release provides a good candidates for future drug delivery applications.

Keywords: Anticancer drug, metal organic gels, drug delivery, Metal-organic frameworks

Introduction:

In the recent years, the use of metal-ligand interactions has provided a new tool to construct the higher dimensional structure due to their dynamic nature [1,2]. The well-known example is Metal-organic frameworks (MOFs) in which metal-ligand interactions have been utilized for various applications [3-5]. However, lower solubility of MOFs limits their application in biological sciences and material science. In view of this, metal organic gels (MOGs) are found to be superior as its viscoelasticity and stimuli responsive behaviour could be advantageous for important environmental and biological applications [1,2,6-15]. For instance, very few MOGs have been found in application in drug delivery [13-15]. Among various applications, one important challenge is to design new non-toxic carriers for efficient drug delivery in the body. As