



Séminaire externe



Responsive Nanozeolites: Smart Porosity and Surface Tailoring for Multimodal Imaging and Therapy of Cancer.



Effective cancer treatment requires its early diagnosis and safe drug delivery systems. Up to date, many theranostics have failed due to their limited ability to reach the diseased site selectively without damaging healthy cells. Furthermore, none of the existing imaging techniques is absolutely reliable due to the differences in contrast resolution and sensitivity. Therefore, synergistic combination of imaging modalities in one probe is the key strategy to benefit, for example from the sensitive and quantifiable PET signal and the high resolution of MRI.

In our research, we investigate the potential of nanozeolites for realization of this concept. These unique crystalline, water-permeable materials have found many applications in various fields due to their ability of stable loading with metal-ions. However, their medical use has not been fully explored yet. One of the promising systems in this respect is nanozeolite LTL, whose structure is characterized by small and big cavities forming linear channels that can accommodate up to 40.000 paramagnetic Gd(III)-ions per particle, resulting in a great enhancement of MRI contrast. Furthermore, we demonstrate the potential of co-loading of these porous nanoparticles with either optically- or radioactive lanthanides for multimodal imaging applications. Finally, we demonstrate that smart surface tailoring of zeolites offers great possibilities to create probes responsive for endogenous stimuli. The current project supported by Le Studium will realize development of the next generation of nanozeolites designed for MRI visualization of cancer cells and responsive drug delivery.

Dr Kristina DJANSHVILI

LE STUDIUM Research Fellow from
Biocatalysis and Organic Chemistry
Delft University of Technology
The Netherlands

in residence at CBM
Eva Jakab Toth Team

Vendredi 20 janvier 2017 à 11h00
Salle de conférence du CBM