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CV/ biography

Franck Camerel studied chemistry at the University of Nantes where he also received his PhD in 2001 for his works on mineral complex fluids at the "Institut des Matériaux Jean Rouxel". He then moved to Max-Planck-Institute of Colloids and Interfaces (MPIKG) as a postdoctoral associate to work on the ionic self-assembly (ISA) process with charged organometallic molecules and inorganic cluster ions. In 2003, he was recruited as a CNRS researcher and joined Dr. Raymond Ziessel's group in Strasbourg where his research activities turn on the design and the synthesis of luminescent liquid crystals for application in optoelectronic and the study of the gelation properties of amphiphilic flurorophores functionalized by hydrogen bonding fragments. Since 2009, he started his independent research activity at the University of Rennes in the development of optically active metal-based molecular entities able to self-organize in solid-state or in solution for applications in optoelectronic and in biotechnologies. He has published 80 peer-reviewed articles (cit 2600).

NIR-Photothermal nickel-bis(dithiolene) complexes for photoresponsive materials and theranostics

Abstract

Metal-bis(dithiolene) complexes are known as strong NIR absorbers in a wide range of NIR wavelengths and have been widely used in laser technologies. However, we have recently demonstrated that nickel-bis(dithiolene) complexes also display strong photothermal activities under laser irradiation in the near infrared region which is a of great interest in material science and in biotechnologies.

First, it has been demonstrated that the photothermal activity of liquid crystals built around metal-bis(dithiolene) complexes can be used to stimulate their self-assembly properties under NIR irradiation, making them good candidates for data storage.[1] Water-soluble metal-bis(dithiolene) complexes can also be used to induce cell death under NIR-laser irradiation, highlighting that such complexes can be good candidates for photothermal therapies (PTT).[2] Recent investigations have also demonstrated that NIR irradiation of nickel-bis(dithiolene) containing organic nanoparticules allows the fine control of the release of their drug contents in solution (Figure).[3] Last but not least, the photothermal properties of metal-bis(dithiolene) complexes can be used develop photoresponsive composite material with liquid crystal elastomer (LCE) of great interest for soft robotics.[4]

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