6th International Conference on Ionic Liquid-based Materials
ILMAT VI
November 22-26, 2021
Obernai, France

Ionic Liquids as highly efficient decontamination systems for Chemical Warfare Agents

Andreia ROSATELLA,[1,2,*] Tiago GONÇALVES,[3] Pedro NETO[3], Vânia Tira-Picos[3], Carlos AFONSO[2]

[1] *CBIOS - Research Center for Biosciences & Health Technologies, Universidade Lusófona de Humanidades e Tecnologias, Campo Grande 376, 1749-024 Lisboa, Portugal.*
[2] *Research Institute for Medicines (iMed.ULisboa), Faculdade de Farmácia da Universidade de Lisboa, Av. Professor Gama Pinto, 1649-003 Lisboa, Portugal*
[3] *UMLDBQ - Military Laboratorial Unit of Biological and Chemical Defense, Av. Dr. Alfredo Bensaúde, Edifício Lab. Militar, 1º andar , 1849-012 Lisboa, Portugal*
*Andreia.rosatella@ulusofona.pt

The use of chemical warfare agents (CWA) to kill or seriously injure not only military soldiers, but also civilian population is a serious threat nowadays, as witnessed in several terrorism attacks in different countries (e.g. subway attack in Tokyo and recently, in Syrian civil war). Although international treaties have banned the development, production and storage of CWA, they are still being produced in some countries. The ability to rapidly respond to such an attack is essential to decrease the number of casualties After the detection and identification of the CWA that have been exposed, it is pivotal to decontaminate not only the personnel but also the materials, equipment and all the area affected by the CWA. There are several reported decontamination methodologies, although the decontaminants used in the field are mainly based on bleach, due to its low price but also due to a broad range of action against different CWA. These types of decontamination systems have several disadvantages since they can be corrosive to some surfaces, are toxic to human health, and are also harmful to the environment.

In this work was developed a novel approach for CWA decontamination where a new material based on Ionic Liquids (ILs) can sequentially adsorb and absorb CWA's from a contaminated surface, or atmosphere into the interior of the material. For that a range of Ionic Liquids were synthetized and tested as sorbents for CWA simulants, resulting in high sorption abilities.

Acknowledgements:
This research was sponsored by the NATO Science for Peace and Security Programme under grant G5713.