

TcSUH SPECIAL SEMINAR

Alexandru Vlad

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IMCN Institute, Université catholique de Louvain, Belgium

Wednesday, July 13, 2022

In Person: Houston Science Center (HSC), 102
2:00 p.m. – 3:00 p.m.

On Zoom: <https://uofh.zoom.us/j/9893378254?pwd=NjZnRlBFQXJBNG9mcHFuaEtjUGdydz09>

Meeting ID: 9893378254

Password: 654321

Chemical and Structural Principles for High Voltage Organic Metal-Ion Positive Electrode Materials



ABSTRACT: 50 years ago, pretty much at the same time when the first man walked on the Moon, battery scientists were also developing the first organic battery! Whereas space science has “rocketed” since, organic batteries, and in general, the battery field, has seen less disruptive advances. Recently however, the organic battery field has seen a renaissance, most certainly driven by the sustainability and the raw materials criticality concerns for the upcoming massive battery demand. However, despite all this effervescence, a key component was missing in the organic battery value chain: the organic metal-ion positive electrode chemistries with practical characteristics - resistant to oxidation and hydrolysis in ambient air in the reduced, metal-ion reservoir form, similar to the conventional metal-ion cathodes. This seminar will broadly debate the possibilities for development of new organic redox chemistries with high voltage, ambient air stability in the metal-ion reservoir form, and intrinsic electrical conductivity. Some of the designed organic chemistries are also found to store not only the monovalent cations but are also highly efficient for the divalent cation storage.

BIO: Dr. Alexandru Vlad received his bachelor’s degree in chemical engineering from University Politehnica of Bucharest (2003) and his Ph.D. in Applied Sciences, Electrical Engineering, from Université catholique de Louvain (Belgium) in 2009. After postdoctoral stays at Chalmers University (Sweden) and Rice University (USA) he was awarded a research fellowship from the National Research Foundation (2011, FRS-FNRS, Belgium). Currently, he is pursuing an academic career at Université catholique de Louvain (<https://vladgroup.org>). His research interests cover the area of materials science, nanotechnology and applied electrochemistry for energy storage and harvesting applications

Host: Prof. Yan Yao, TcSUH PI, yyao4@central.uh.edu

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