

Advanced materials chemistry for rechargeable potassium-ion battery

Titus Masese

National Institute of Advanced Industrial Science and Technology (AIST), Japan AIST-Kyoto University Chemical Energy Materials Open Innovation Laboratory (ChEM-OIL), Japan

Abstract

Advanced rechargeable potassium-ion (K-ion) batteries are a new generation of battery systems and are deemed not only as lucrative low-cost battery alternatives to the current lithium-ion (Li-ion) technology but also as high voltage energy storage systems. The development of a K-ion battery with comparable performance as Li-ion battery is, however, a challenge because of the higher mass and larger ionic size of K-ion than that of Li-ion, which makes it difficult to identify materials (particularly cathodes) that can facilitate reversible insertion of the large K-ions at high voltages and reasonable capacities. In this talk we will highlight our recent progresses in developing materials for rechargeable K-ion batteries, through the screening of the broad minerals and compounds database relating to potassium-based materials aided with computational chemistry. We believe that materials exploration through computational chemistry will serve as a cornerstone for new research opportunities in the development of practically-usable and low-cost K-ion battery chemistries using ubiquitous potassium-containing materials.

Biography:-

Titus Masese has received his BS, MS and PhD degree from Kyoto University. He is currently a Research Scientist at the National Institute of Advanced Industrial Science and Technology (AIST) located in Japan. His research interests include the synthesis and physicochemical characterisation of novel functional materials for potassium, sodium, magnesium, calcium and advanced lithium-ion batteries. He has filed more than 30 patents and has published more than 25 papers in reputed journals.

Note: - This work is partly presented at International Webinar on Gene Therapy, May 29, 2021 as per GMT+1 Timings.