2024

PSK-이녹스 신진연구자 웨비나

2024년 8월 13일(화) PM 16:40 - 18:00 | 온라인 상

https://postech-ac-kr.zoom.us/j/88471232313

주최 한국고분자학회 **주관** 에너지 부문위원회 **후원** INNOX

○ 초대의 글

'PSK-이녹스 신진연구자 웨비나'는 우수한 연구역량을 가진 신진연구자를 발굴하여 교류의 장을 넓히고자 (주)이녹스의 후원과 한국고분자학회 주최로 마련한 온라인 세미나입니다. 이번 세미나에서는 고분자 분야 중에서도 특히 에너지 전환 및 저장 소재를 이용하여 선도연구를 수행하는 신진연구자의 우수한 연구성과를 공유하는 자리를 마련하였으니 관심있는 분들의 많은 참여 부탁드립니다.

○ 일정

PM 16:40 - 17:20	Surface Engineering-induced LiF-rich Solid Electrolyte Interphase Formation Huding Jin (김호정), kimhd15@snu.ac.kr Institute of Chemical Processes, Seoul National University

ABSTRACT: Considering the typical properties of Li metal, such as high theoretical specific capacity (3,862 mAh g^{-1}) and low negative electrochemical potential [-3.04 V (vs a standard hydrogen electrode)], Li metal anode (LMA)-based batteries (LMBs) have attracted considerable attention as promising next-generation energy storage technology. Despite their immense potential, commercializing LMBs remains a formidable challenge, as issues such as limited actual capacity, low coulombic efficiency (CE), short battery lifespan, and safety concerns. Fundamentally, the root of these issues is an unstable solid electrolyte interphase (SEI) passivation layer formed on the LMA surface during cycling. Specifically, this unstable SEI layer could result in inhomogeneous Li^+ flux, fail to curb the volume expansion of the LMA, and ultimately reduce battery lifespan and stability due to rapid LMA consumption and dendrite growth. Hence, the rapid formation of a stable SEI layer at the early cycling stage becomes a crucial objective when employing LMA as a battery anode. In this talk, I will present our surface engineering approach to generating a LiF-rich SEI by controlling Li^+ movement. This initial stable SEI formation promotes the subsequent homogeneous flux of Li^+, thereby improving the LMA stability and yielding an enhanced battery lifespan. This approach offers significant contributions to the energy storage field by addressing challenges associated with LMAs, thus highlighting the importance of interfacial control in achieving a stable SEI layer.

PM 17:20 - 18:00	Design and Development of Triboelectric Nanogenerator for Powering Implantable Devices and Pathogen Control Young-Jun Kim (김영준), kimyjun@krict.re.kr Advanced Functional Polymers Research Center, Korea Research Institute of Chemical Technology

ABSTRACT: In pursuit of technologies that can extend human lifespan, we can develop implantable medical devices aimed at dramatically increasing lifespan, or prevent a decrease in lifespan by preparing for a pandemic. However, the development of these two technologies is currently limited due to the lack of suitable energy sources. A triboelectric generator, which allows for considerable freedom in material selection, can address the energy requirements of both technologies. Here, we have improved the output of the triboelectric generator through the development of material and structural modifications and investigated its potential as a power source for implantable medical devices and pathogen control technology such as those for viruses and bacteria.

한국고분자학회
The Polymer Society of Korea