

세미나 초록

성명	권지언
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발표 주제	Redox-active Organic Molecules: Sustainable Electrode Materials for Future Batteries
발표 내용	<p>Redox-active organic molecules (ROMs) are drawing significant attention as promising alternatives to conventional transition metal oxide electrodes for secondary batteries. Their appeal stems from numerous benefits including abundance, sustainability, biocompatibility, cost-effectiveness, and ease of chemical tunability. Notably, their flexible nature with large free volume, owing to loosely packed intermolecular structures, is expected to facilitate fast diffusion of charge-carrying ions – a key attribute for enhancing the high-rate performance of electrode materials. Yet, the practical application of ROMs is hindered by their slow rate capability with limited capacity utilization, a consequence of their intrinsically insulating properties. Furthermore, high solubility of ROMs in organic electrolytes have brought rapid capacity fading within a few initial cycles, compelling one to prepare polymers via complicated synthesis and/or to fabricate composites with expensive nanocarbons.</p> <p>In this talk, we introduce our novel molecular design strategies to improve the energy density, cycle stability, and rate performance of ROMs, paving the way for the development of sustainable organic batteries.</p>