



Colloquium

Materials and reaction mechanisms in main group redox chemistries

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Life demonstrates powerful energy storage using the redox chemistry of main group elements. Yet, human-made electrochemical energy storage relies on elements, which are often scarce, toxic, and energy-hungry in production and recycling. The redox chemistry of main group elements known to the biosphere would therefore be key to more sustainable energy storage. On the one hand, sulphur and oxygen can be used directly in metal-sulphur or metal-oxygen batteries or anionic redox materials. Such batteries deliver the largest possible energies. However, the solid, insulating products are challenging, and hence (electro)chemistry and phase evolution are critical to be understood. On the other hand, organic redox active materials could be sourced from and recycled by living nature, but require fundamental advances to compete with existing technology. Here, I discuss recent progress with new materials and fundamental understanding of the reaction mechanisms underpinning main group redox chemistries as well as the challenges ahead.

Friday, January 12, 2024 11:00am - 12:00pm

Raiffeisen Lecture Hall



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