

# Structure Study of a New Family of Low-Cost Sodium-Ion Battery Cathode

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Sodium-ion batteries have gained tremendous momentum in recent years, mainly due to its lower cost, better safety and better low temperature performance relative to the current lithium-ion battery technology. Despite their concept similarity, Na-ion batteries offer a much broader playground for exploring new electrode materials. For instance, exploring new cathode materials with low cost and earth abundant transition metals (e.g., Fe and Cu), those are not suitable for the current Li-ion battery cathodes. In this talk, I will highlight our recent work on designing and synthesizing a new family of low-cost, earth abundant sodium-ion battery cathodes. Particularly, I will discuss how multimodal structure studies can help facilitating designing strategies to realize small voltage hysteresis in Na-ion cathode using lattice oxygen redox reactions. I will also discuss detailed structure studies, including ab initio structure solution, in situ monitoring structure evolution using high resolution XRD and EXAFS, of a new Cu-based Na-ion battery cathode. I also plan to discuss future opportunities in designing new sodium-ion cathodes and particularly on how structure studies can help realizing these goals.