

Faculty Name:

Yuan Yang

Faculty Email:

yy2664@columbia.edu

Lab:

Yang lab

Project Title:

Electrolyte screening for high-performance Na-K/S batteries

Description:

The research position targets to develop electrolytes for Na-K/S battery for Long-duration energy storage (>10 hours, LDES), which is critical to the deep penetration of intermittent renewable energy (e.g., solar/wind). Conventional Na-S and K-S batteries are attractive for LDES due to their low cost and the use of only earth-abundance elements. However, their deployment is severely hindered by their high operational temperature of 300-350 oC and associated degradation and safety issues. This project will develop innovative electrolytes to dissolve insoluble reaction products in Na-S and K-S batteries and advance knowledge on underlying dissolution mechanisms. Such novel electrolytes will enhance reaction kinetics so the operation temperature can be reduced to 60-120 oC, which not only enhances thermal stability but also decreases operational costs.

The student will be responsible for examining solubility of sulfides and polysulfides in different solvents at different temperatures, and performing cyclic voltammetry to understand electrochemical stability of these electrolytes.

Location of Research:

On Site

of hrs/week:

35

Department/Program:

Applied Physics and Applied Mathematics

Eligibility:

MS

To apply, please contact:

Yuan Yang

yy2664@columbia.edu