Showcasing research from Professor Huajun Tian's laboratory, School of Energy Power and Mechanical Engineering, North China Electric Power University, Beijing, China.

High-rate rare-earth-based high-entropy Co-free high-Ni cathodes for high-performance lithium-ion batteries

In this work, a family of rare-earth-based high-entropy Co-free high-Ni cathode materials $LiNi_{0.9}Mn_{0.02}Al_{0.02}Mg_{0.02}Ti_{0.02}Si_{0.02}O_2$ (Lu substitutes Si, Ti, Mg, and Al, respectively), constructing a promising high-rate rare-earth high-entropy Co-free high-Ni layered cathode $LiNi_{0.9}Mn_{0.02}Al_{0.02}Mg_{0.02}Ti_{0.02}Lu_{0.02}O_2$ (HE-Lu), was successfully explored. The designed HE-Lu cathode achieves ultra-stable cyclability at a high discharging rate. This work provides a promising strategy for designing Co-free, high-Ni cathodes in high-rate lithium-ion batteries.

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