

Multivalent-ion active organic materials toward development of sustainable battery technology

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The ever-growing energy demand and rapid adoption of rechargeable Li-ion batteries urge a quest for sustainable battery technology as many elements currently used in Li-ion batteries, including cobalt and lithium, are scarce in the earth crust.^[1] In this sense, a collection of transition-metal free organic molecules containing electrochemically active moieties is one of the promising candidate electrode materials. However, such molecules have high solubility in commonly used carbonate based electrolyte, leading to catastrophic capacity decay.^[2] On the other hand, magnesium-ions (Mg-ions) battery is also attractive due to its enhanced safety, natural abundance and high capacity due to multi-electron transfers per each shuttling ion. However, challenges in Mg-ion battery remains the lack of electrolyte systems stable for Mg metal anode with wide electrochemical window.^[3] Here, we explore various electrolyte systems for Mg-organic battery toward development of sustainable battery technology.

References:

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