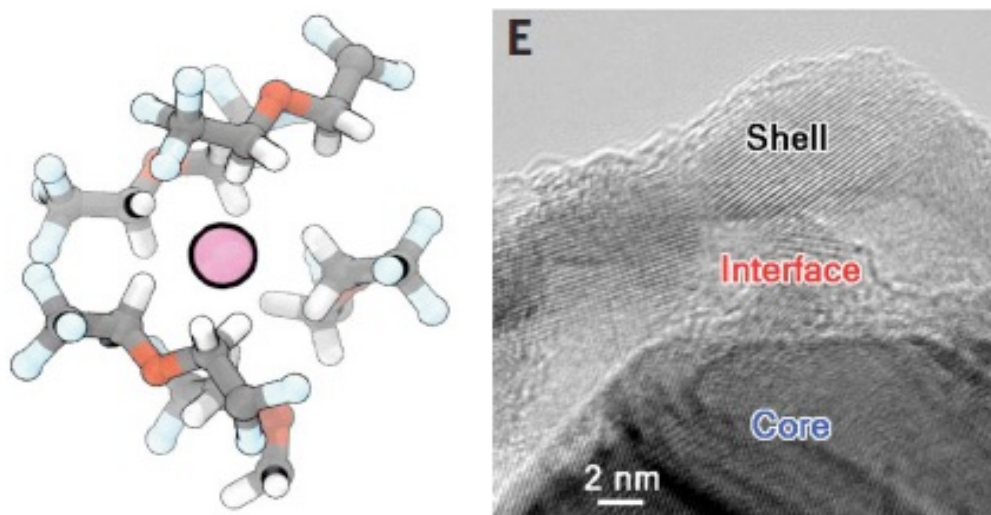


Room-temperature cycling of metal fluoride electrodes: Liquid electrolytes for high-energy fluoride ion cells

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Fluoride ion batteries (FIBs) are potential “next-generation” electrochemical storage devices that offer high energy density. At present, such batteries are limited to operation at high temperatures because suitable fluoride ion-conducting electrolytes are known only in the solid state, with very limited ionic conductivity at room temperature. We report a liquid fluoride ion-conducting electrolyte with high ionic conductivity, wide operating voltage, and robust chemical stability based on dry tetraalkylammonium fluoride salts (NpF) in ether solvents (BTFE). To mitigate challenges associated with cathode metal dissolution, we pairing this liquid electrolyte with a copper-lanthanum trifluoride (Cu@LaF₃) core-shell cathode. we demonstrate reversible fluorination and defluorination reactions in a fluoride ion electrochemical cell cycled at room temperature.



Main reference:

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