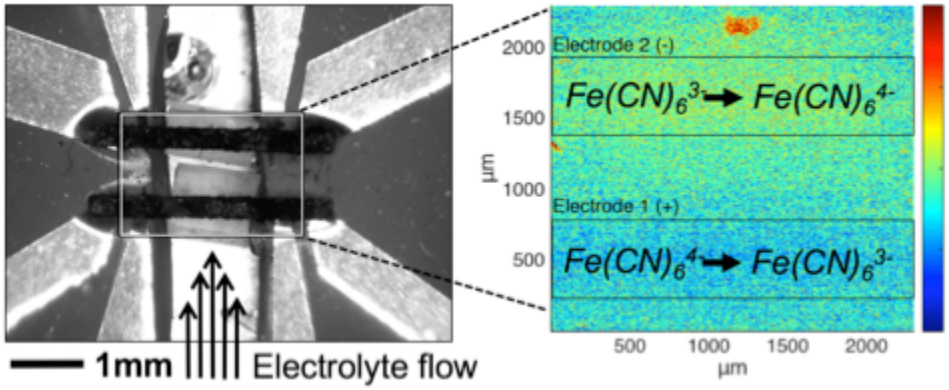
Docket #: S19-100

Electrochemical redox refrigeration device

Stanford researchers have made an electrochemical redox refrigeration device that provides high cooling power densities without the environmental liabilities of hydrofluorocarbon refrigerants. The device resembles a liquid version of a Peltier cooler, but with 10x larger entropy change per carrier compared to state-of-the-art thermoelectric materials. This ultra small-scale device can easily be combined with existing liquid-based cooling systems, and potentially take the place of solid-state thermoelectric coolers.



Redox refrigerator device electrodes and electrolyte flow channel in optical and IR views.

Applications

- Air conditioning and refrigeration
- Microprocessor and battery cooling

Advantages

- Hydrofluorocarbon (HFC) free refrigeration and cooling

Publications

- I.S. Mckay, L.Y. Kunz and A. Majumdar Electrochemical Redox Refrigeration *Nature Scientific Reports* 13945(2019)

Patents

- Published Application: 20200325379
- Issued: 11,926,783 (USA)

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