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Electrode Modifications for Redox Flow Batteries

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Summary

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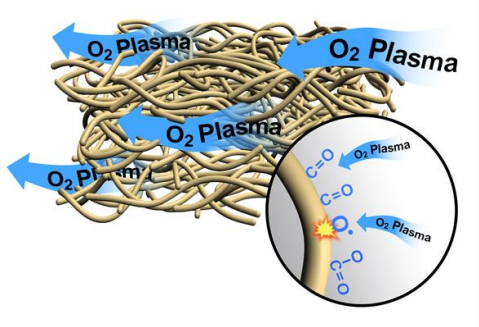
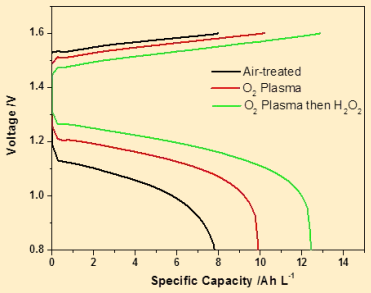
Tunable oxygen functional groups

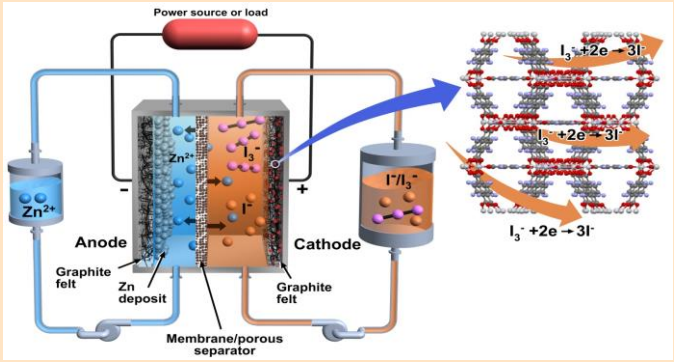




- The catalytic effects for different types of functional groups were identified effectively.
- O-C=O groups improve the cells performance while the C-O and C=O groups degrade it.
- This highlights a new preferred pathway to functionalize carbon materials used in VRB cells in the future.

Estevez L, DM Reed, Z Nie, AM Schwarz, MI Nandasiri, JP Kizewski, W Wang, EC Thomsen, J Liu, J Zhang, VL Sprenkle, and **B Li***. 2016. " Tunable oxygen functional groups as electro-catalysts on graphite felt surfaces for all vanadium flow batteries." ***ChemSusChem*** 9(12):1455-1461.

MOFs applied in RFB for the first time



- Metal-organic frameworks (MOFs) have been considered as advanced catalysts because of their extraordinary surface area, tunable pore geometries, and unlimited chemical composition.
- Chemically stable nanoporous MOFs in electrolytes as catalysts were found and in-situ grown on graphite electrode, effectively enhancing the electrode properties by accelerating the I_3^-/I^- redox reaction.
- This highlights a way for MOFs to be used in the field of RFBs.

Li B*, J Liu, Z Nie, W Wang, DM Reed, J Liu, BP McGrail, and VL Sprenkle. 2016. "Metal-organic frameworks as highly active electrocatalysts for high-energy density, aqueous zinc-polyiodide redox flow batteries." ***Nano Letters*** 16(7):4335-4340.