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Polyoxometalates (POMs) are one of unique metal-oxo clusters with fascinating structural topologies, attractive acidic and redox properties and potential applications in catalysis, medicine, nanomaterials, photo-, electro- and magnetic materials. The oxygen-rich surfaces of the POM clusters show active coordination ability with various transition metal ions, lanthanide ions even organic molecules. Thus, it can not only act as molecular building blocks to construct high-dimensional frameworks, but also use as multi-dentate ligands to aggregate TM and/or Ln ions into polynuclear metal clusters. We focus on three research topics: (i) Design and synthesis of POM-based MOFs; (ii) Assembling new polynuclear metal-oxo clusters by the use of lacunary POMs and various TM and Ln ions; (iii) Using various POM-based molecular materials as the platform to fabricate Mo/W-based elecrocatalysts for HER, OER, ORR and CO_2 reduction.

Possible Collaborations: Ken Sakai, Osamu Ishitani, Anna Proust, Elizabeth (Libby) Gibson

Reference:

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