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Electrocatalysis and photocatalysis are considered to be one of the most important and promising technologies for new energy conversion, storage and environmental restoration. The development of high performance catalysts and the study of its catalytic processes and mechanisms are currently hot and challenging topics. Polyoxometalates are one kind of nano metal-oxygen clusters with clear structure and tunable composition. It is an ideal molecular catalytic model and pre-assembly platform. We selected it to design and fabricate a series of highly efficient non-precious metal HER electrocatalysts **CoMoP@C** and **Ni/WC/C** from the atomic or molecular level. In addition, using the reversible multi-electrons and protons storage characteristics of POMs, we realized the regulation of the electron transfer of CO_2 reduction reaction on electrode, and prepared a series of POMs-based environment photocatalysts. These works has verified the important potential application prospects of polyoxometalates in the field of energy and environmental catalysis, and provided an important reference for the development of new POMs-based functional materials.

Possible Collaborations: Graham Newton, Ken Sakai

Reference:

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