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**Research keywords:** All inorganic microporous materials, Building units, Transition metals, Selective oxidations

We have been synthesizing microporous materials with all inorganic manner using transition metals as main constituents and developing them for various applications such as catalysts, selective adsorptions, cathode material for lithium ion battery, etc. For the synthesis of these materials, we create various polyoxometalates (POMs) in the precursor solution using various transition metals. These

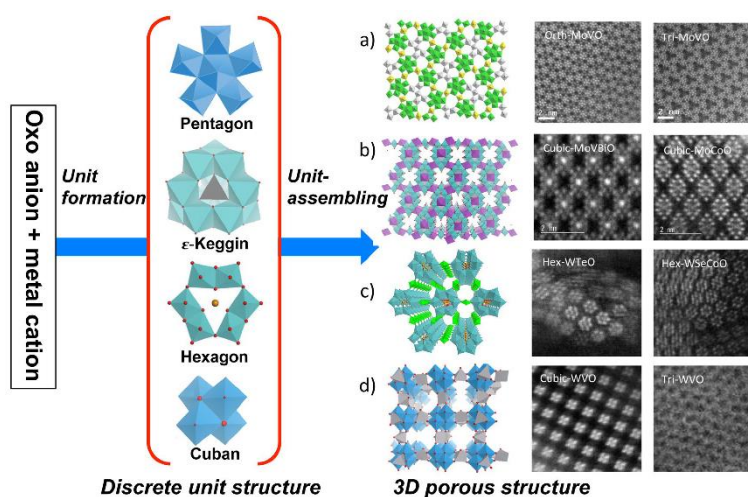


Figure. Four distinct metal oxides with 3D porous structures derived from discrete unit assembling. a)-d) are structure models and HAADF-STEM

POMs are assembled for each other with appropriate inorganic linker under an appropriate hydrothermal condition to form highly organized crystalline materials. Thus obtained materials form micropores in the crystal structure like as zeolites and show attractive properties based on its highly organized crystalline structure and the redox natures.

➤ **Possible collaborations**

Selective oxidation, adsorption

- **Reference.** [1] Ishikawa, S.; Zhang, Z.; Ueda, W. *ACS Catal.* **2018**, *8*, 2935-2943. [2] Zhang, Z.; Ueda, W, *et al. Nat. Commn.* **2018**, *6*, 7731.