

	Yuji Kikukawa
	Associate professor Faculty of Chemistry, Institute of Science and Engineering, Kanazawa University
	kikukawa@se.kanazawa-u.ac.jp
	http://chem.s.kanazawa-u.ac.jp/inorg/

Research keywords: Vanadium, Structure Transformation, Catalysis, Host-Guest System

Host-Guest Chemistry of Dodecavanadate

Vanadium-based polyoxometalates show structural versatility. Especially, square pyramidal VO₅-based polyoxometalates tend to form a spherical-type structure that allows guest anions to be accepted at the center. A particularly intriguing example is that of a bowl-type polyoxometate framework, [V₁₂O₃₂]⁴⁻ (**V12**), which possesses a 4.4 Å wide cavity entrance surrounded by eight oxygen atoms. In the cavity, an electron-rich group or an anion can be stabilized via unique electrostatic interactions.^[1] By removing a guest moiety, a guest free type of **V12** (**V12-free**) with a bottom-flipped bowl structure was prepared.^[2] The prohibition of the guest-removal was demonstrated with a chloride-incorporated **V12** (**V12(Cl)**). By adding acid and base, the reversible structure transformation of **V12(Cl)** with opened form and closed form. The incorporated chloride was preserved in the closed form even in the presence of a silver cation, while the chloride in opened form was removed as AgCl.^[3]

Our group is good at synthesis of novel POMs, structure transformation, rational modification of POMs and their characterization. We can offer several kinds of POMs and can collaborate on the adsorption IR measurements, the single crystal and powder XRD analysis, and the catalyst activity evaluation.

Reference. [1] (a) S. Kuwajima, Y. Ikinobu, D. Watanabe, Y. Kikukawa, Y. Hayashi, A. Yagasaki, *ACS Omega*, **2017**, 2, 268. (b) S. Kuwajima, Y. Kikukawa, Y. Hayashi, *Chem. Asian J.*, **2017**, 12, 1909. [2] (a) Y. Kikukawa, K. Seto, S. Uchida, S. Kuwajima, Y. Hayashi, *Angew. Chem. Int. Ed.* **2018**, 57, 16051. (b) Y. Kikukawa, H. Kitajima, Y. Hayashi, *Dalton Trans.* **2019**, 48, 7138. (a) Y. Inoue, Y. Kikukawa, S. Kuwajima, Y. Hayashi, *Dalton Trans.*, **2016**, 45, 7563. (b) S. Kuwajima, Y. Arai, H. Kitajima, Y. Kikukawa, Y. Hayashi, *Acta Crystallogr.* **2018**, C74, 1295.