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We have tried to prepare novel polyoxometalates (POMs) by using different hetero ions. A lot of novel metal-substituted tungstosulphates and organo-phosphates incorporating POMs have been prepared, isolated and characterized with various synthetic techniques [1]. We have focused on electrochemistry of POMs, which is very rich since many electrons transferred processes occur without decomposition. Although many of POMs have been applied to important fields such as battery and water splitting based on their electrochemical properties, there are still unclear aspects on the voltammetric behavior. We have tried to elucidate the detailed voltammetric behavior with simulation of cyclic voltammograms with a help of NMR, ESR and the other measurements [2]. In addition, we have been interested in new (electrochemical) sensors with POMs. Formation reaction and reduction of POMs have been used for spectrophotometric determination of phosphorus and silica, so called molybdenum blue method and molybdenum yellow method [3]. Achievements of our studies on POMs improved sensitivity in molybdenum blue method. In addition, electrochemical method of antioxidant capacity has been developed to measure more easily than the reported methods: ORAC and DPPH [4]. I hope to make new collaborations with anyone who is interested in the development of catalytic reactions and sensors with my POMs and/or electrochemistry of your POMs.

References

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