

ロボットを用いた酸素生成用助触媒の高速スクリーニング

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High-throughput screening for oxygen evolution cocatalysts using robots (*National Institute of Advanced Industrial Science and Technology (AIST)*) ○Masanori Kodera, Yugo Miseki, Yoshinari Konishi, Kazuhiro Sayama

Highly efficient oxygen evolution cocatalyst is a key component in the feasible water splitting system using photocatalysts. Recently, cocatalysts containing several metal ions are extensively investigated¹⁻³, although a huge number of experiments are required to optimize the composition and so on. Therefore, high-throughput screening is expected to boost this kind of studies. Our team developed the robot named high-throughput automatic photocatalyst performance analyzer (HAPPA). In Fig. 1, a photo of HAPPA is presented. It enables a high-throughput screening for electrode and particulate materials which contained more than two metal ions. In this presentation, we introduced the HAPPA system in detail and show the results in oxygen evolution electrodes with three kinds of metal ions.

Keywords : High-throughput, Oxygen evolution, water splitting, Machine learning

光触媒を用いた高効率な水分解反応系構築に向けて、より高性能な酸素生成助触媒の開発が求められている。近年、3種類以上の金属元素を含む多元系助触媒が検討されているが¹⁻³、組成最適化に限っても膨大な試行回数が必要であるため、高速探索手法の開発が必要である。発表者らは高速スクリーニングロボット (High-throughput automatic photocatalyst performance analyzer, HAPPA) を開発した。Fig. 1 に HAPPA の装置写真を示した。HAPPA を用いることで多元系電極・粉末触媒の高速スクリーニングが可能となる。本発表では HAPPA の概略説明と、その結果の一例として3元系酸素生成用電極触媒の開発事例について述べる。

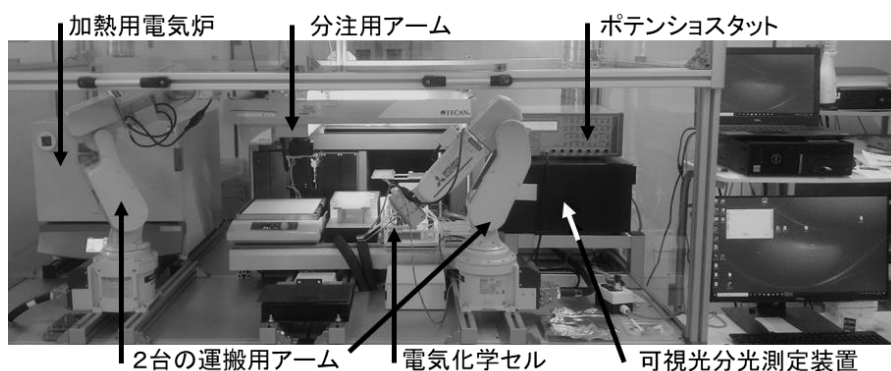


Fig. 1 photo of high-throughput automatic photocatalyst performance analyzer (HAPPA).

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