

High-throughput screening of Ru-based catalysts for oxygen reduction reaction

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A series of Ru-based catalysts for proton exchange membrane fuel cell (PEMFC) and direct methanol fuel cell (DMFC) have been evaluated towards oxygen reduction reaction (ORR), by high-throughput optical screening. Fluorescein was used as pH indicator for detecting pH change of the electrolyte in the vicinity of cathode caused by ORR. Arrays of catalyst spots comprised of binary, and ternary Ru-based catalysts were prepared. The analysis of fluorescence images has showed that at certain compositions of Ru-based alloy catalysts exhibited high activities toward ORR. The high-throughput screening is a methodology that can evaluate a vast range of catalysts, which is required in the search for alternative cathode catalyst in PEMFC or DMFC.