

Composition optimization of PtRuFe/C and PtRuMo/C catalysts for methanol oxidation and oxygen reduction of DMFC with combinatorial method

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Combinatorial method was developed to find the best material quickly. In this study, to solve the problem of DMFC, price competitiveness, cheap and high activity catalysts are researched with combinatorial method. We prepared a combinatorial array of 121 spots that have different compositions of the PtRuFe/C and PtRuMo/C catalysts. The synthesized array was evaluated one by one for methanol electro-oxidation and oxygen reduction. In methanol oxidation, PtRuMo(5,3,2)/C, PtRuMo(4,3,3)/C, PtRuFe(5,4,1)/C, and PtRuFe(4,4,2)/C show better performance than PtRu(2:1)/C. In oxygen reduction, PtFe(8,2)/C, PtMo(9,1)/C, PtRuFe(8,1,1)/C, PtRuFe(7,1,2)/C, PtRuFe(6,1,3)/C, PtRuMo(4,2,4)/C, and PtRuMo(4,3,3)/C show better performance than Pt/C composition. Furthermore, Selected compositions are evaluated individually.