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Utilization of Combinatorial Method and High Throughput Experimentation for Development of Heterogeneous Catalysts

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The combinatorial method and high throughput experimentation have been applied to catalysis development in the last decade. Here we describe equipment for catalyst preparation, catalysis evaluation and product analysis with a gas sensor system. High throughput experimentation using these devices has allowed us to optimize catalyst composition with stochastic methods such as the genetic algorithm. The improvement of propane selective oxidation catalysis is described. High throughput experimentation allowed the construction of a database for elemental reactions. We have developed novel catalysts for ethanol steam-reforming catalysts and a dimethyl ether steam-reforming catalyst by combining good catalysts for each elemental reaction. Our new concept of "Materiomics" is introduced as a promising method for material science based on combinatorial technology.

Keywords: [Combinatorial method](#), [High throughput experimentation](#), [Materiomics](#), [Heterogeneous catalyst](#)



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