Development of mixed-metal oxide catalyst on propane selective oxidation by using combinatorial chemistry

임지훈, 우성일*
한국과학기술원 초미세화학 공정센터(CUPS)
(siwoo@kaist.ac.kr*)

Combinatorial methods are now being widely spread to develop advanced functional materials for catalysis, fuel cell, polymers, electronic, sensors and display. When these exists a huge experimental variable space, millions of samples should be rapidly prepared, characterized and evaluated to find the quantitative structure-activity relationship (QSAR). Library work-up and library design should be done by data mining and artificial intelligence.
The 32-channel sequential/parallel fixed bed reactor system (SUPER-Ⅱ) was developed and all the operations were computer-controlled. This reactor can be used to analyze and compare the catalytic activity each other from room temperature to 1000 ℃, because each channel was composed by quartz. The error in the flow in each channel was 1.5% and temperature distribution in each reactor was 1%. Quaternary catalysts containing Mo, V, Te and Nb were found to be highly active in Propane partial oxidation.