

Why catalysis is regarded as the queen of science? Nowadays it is hard to imagine modern civilization without the chemical industry, moreover the vast majority of industrial processes, by as much 90% of these are catalytic processes. It is also difficult to imagine a contemporaneity without microprocessors, which constitute the second giant branch of the industry. If consider the degree of technological sophistication, precision and functionality, the catalytic reactors remain well behind the microprocessors. What if we start thinking about the chemical reactors like we think about the microprocessors and designing chemical reactors with such precision and accuracy like microprocessors? This means that the structure of chemical reactors should be attributed to the atomic scale. If we replace the fixed-bed of catalyst fillers of specified geometry, that will have on their surface the reactionary centers designed at the atomic scale, we will get closer to the idea of microprocessors. These reactors are called structural reactors.

In this project structural reactors for the methane combustion will be designed. Methane is a greenhouse gas significantly more dangerous than carbon dioxide. Methane is emitted to the atmosphere from many sources such as refineries, mines, transport and breeding animals. At the same time, methane due to the high activation barrier of the reaction, despite appearances is difficult for combustion. Structured reactors may prove to be useful in the combustion of methane originating from the above mentioned sources. Their designing for the combustion of methane is the keynote of this project.