

Catalytic activity is the rate of a chemical reaction, referred to the number of active catalyst centers or to a unit of mass or volume of the catalyst. The activity of the catalyst is determined by the nature and strength of the chemical bonds that are formed when reactants and reaction intermediates are bound to the catalyst. For a correct measurement of the catalytic activity it is necessary to exclude the impact of mass and heat transfer.

The catalytic center is the center in which catalytic chemical transformations occur. If the number of the catalytic centers is unknown, for example, in case of a heterogeneous photocatalysis, for determination of specific parameters BET surface measured on nitrogen adsorption is used.

Catalytic combustion is a technology developed to produce thermal energy by oxidizing combustible compounds with oxygen in the presence of a catalyst. In the presence of catalysts, oxidation occurs at lower temperatures (without open flame). Multicomponent catalysts containing Cu, Cr, Pd, Mn and other components are used. Catalytic combustion is used in catalytic heat generators (CHG).

The catalytic converter (neutralizer) of exhaust gases of the car engine is the device for neutralization of the exhaust gases of the car engine by a method of catalytic action. It is a catalyst that provides removal of a number of harmful substances from the exhaust gases in the internal combustion engines. The main catalytic processes are oxidation of CO, post-combustion of hydrocarbons to CO₂ and reduction of nitrogen oxides. The most suitable are noble metal catalysts (Pt). The neutralization process is complicated due to temperature fluctuations in the exhaust gases (from 200 to 1,000°C) and changes in the composition of the gas mixture (from oxidizing with excess oxygen to reducing with oxygen deficiency).

Catalytic cracking is a secondary process of oil refining (process of conversion), which consists in splitting of long hydrocarbonic molecules into shorter ones. It is the process of breaking up heavier hydrocarbon molecules into lighter hydrocarbon fractions by use of heat and catalysts and a source of petrochemical raw materials, such as propane-propylene fraction.

Catalytic reforming is a secondary process of oil refining, the essence of which is the conversion of hydrocarbon chains into aromatic compounds - components of fuels and petrochemical raw materials.

Catalytic cycle is a system of elementary reactions with participation of the catalyst at which the sequence is closed, a cyclic process of binding and regeneration of the catalyst occurs and the conversion of the starting materials to the products. An important feature is that after completion of the catalytic cycle, the catalyst passes to the initial chemical state and the catalytic cycle can be repeated many times with the same catalyst.

Catalytic erosion is the destruction of the catalyst in the dendritic mechanism of coke formation. Separate components of the catalyst are mechanically separated and carried away with the growth of primary dendrites, which can lead to the complete destruction of the catalyst.

The catalytic reaction is a chemical reaction proceeding through a sequence of stages forming a catalytic cycle. The catalytic route of the reaction is proved by the fact that the catalytic cycle can be realized several times (the number of revolutions exceeds unity). Currently, more than 80% of all industrial chemical processes are carried out using catalytic reactions.

Catalytic poison is a substance that forms strong chemical bonds (usually covalent) with atoms and ions entering the active sites of the catalyst to form catalytically inactive centers and, thus, leads to deactivation of the catalyst. In most cases, the catalytic activity and/or selectivity cannot be restored without a significant change in the reaction conditions. Special regeneration procedures are required, and most often the characteristics can only be partially recovered. The catalytic poison may be present as an impurity in a mixture of reagents, or it may enter the catalyst during the preparation stage. Typical poisons are sulfur and arsenic compounds, and also the compounds of transition metals contained in raw materials can act as catalytic poisons.

Cementing materials are substances that can harden as a result of physicochemical processes. Passing from a pasty to a stone-like state, an astringent holds together stones or grains