

These data also can be used to predict the output of other products of coking.

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The use of hydrogen peroxide for the study of redox catalysis

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Catalysis plays an important role in the modern chemical technologies. People can receive various materials, fuel, fertilizers, pharmaceuticals, food additives, etc. using catalytic processes. New discoveries arising in the course of basic research in catalysis foreshadow the emergence of technologies that could significantly change the chemical industry, as well as complement the theory of catalysis.

Experiments have been conducted to study the catalytic properties of the transition metals deposited on the substrate, which is a modified mineral reserves in the world which can create and use a surface-type catalyst on a commercial scale. The studies have been synthesized artificial surface-type catalysts based on the concept of education nanoscale catalytic sites on the solid surface by means of nano-sized carbon exchange [1]. Thus, it has been possible to achieve maximum utilization of the catalytic properties of metal per unit mass, which is especially valuable for precious and rare transition elements.

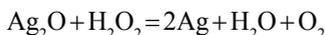
Hydrogen has been used peroxide solutions as a model of substance for study of the catalysts. This material is conveniently used to test and quantify the presence of the catalytic properties of substances in the redox catalysis, which are observed at the transition elements.

Alkaline environment does not cause decomposition of hydrogen per-

oxide, but strongly promotes its catalytic decomposition. On the contrary, the acidic environment makes it difficult to decay. Decomposition of hydrogen peroxide is faster with heating and light. Hydrogen peroxide is a strong oxidizing agent, i.e. excess gives its easily (than the more stable compound – water) oxygen atom. Characteristic of hydrogen peroxide oxidative decay can be schematically depicted as follows: $\text{H}_2\text{O}_2 = \text{H}_2\text{O} + \text{O}$ (on oxidation). Acidic environment is more conducive to this decay than alkaline.

For hydrogen peroxide is significantly less typical than reduction decay scheme: $\text{H}_2\text{O}_2 = \text{O}_2 + \text{H}_2$ (recovery). Alkaline environment is more conducive to such decay than acidic.

The reducing hydrogen peroxide decomposition takes place, for example, in the presence of silver oxide:



As it can be seen, the hydrogen peroxide may be applied to assess the catalytic properties of substances, such as rehabilitation and in oxidation [2].

We have developed a very simple method for the study of powder catalysts with a solution of hydrogen peroxide. Glass wool has been placed at the bottom of the syringe; it has been poured catalyst curtained on an analytical balance. Then the piston has been inserted and excess air has been squeezed out the. Hydrogen peroxide solution has been drawn through in an amount 3 cm^3 a thin needle (needle has been placed on pre-weighed cuvette) and the countdown begins. When the displacement of water ($0.5\text{--}1.0 \text{ cm}^3$) cell has been weighed and the time spent in the experiment has been recorded. All subsequent experiments have been already on a fixed period of time. Thus, comparative characteristic catalytic activity per gram of the substance has been obtained.

By this procedure the relative catalyst activity has been investigated on the basis of mineral lilit. When boiling powder lilit with silver nitrate catalytic activity decreased. Pretreatment lilit by 20% nitric acid followed by treatment with nitrate and heating to 210°C has yielded a ten-fold increase in catalytic activity. Wherein the surface is partially oxidized to carbon melitovoy acid, leaving a solution and formed on the surface carboxylic acid groups associated with the carbon. Palladium well has been suited for the first and second methods, the increase in the method according to the latest all increased by 1.2–1.5 times.

In general, the palladium catalyst has been proved to be the strongest, followed by the silver, then iron. Based on copper, nickel and cobalt such techniques have given poor results, probably because of their low degree of hydrolysis and partial surface washes nitrates.

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Expression of hydrophobins for protective coating of polymeric nanoparticles for drug delivery

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The use of nanotechnology in medicine and more specifically in drug delivery extends rapidly. Nanoparticles, that are becoming important instruments in the area of medical treatment, have the potential to enhance the therapeutic efficacy of medicine. However, particle properties have to be carefully engineered in order to regulate drug release and prolong the residence time in the body. Currently, chemical stabilizers (e.g. poloxamers) with limited biocompatibility are used to facilitate preparation and ensure formulation stability. Alternative strategies for surface-modification are urgently searched after. A synergistic approach with multiple benefits would be to coat the nanocarriers with self-adhesive proteins. Hydrophobins are unique fungal amphiphilic proteins with a broad range of biocompatibility with different materials. They are also considered to be suitable for surface modification and biomolecule immobilization purposes also because they are immunologically inert [1]. Thus, therapeutic agents such as enzymes can be encapsulat-