

Mechanochemical Interaction of Biologically Active Substances with Natural Silicates

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The progress in the solid medical cosmetics and prolonged medicines is connected with successes of mechanochemistry. The layered silicates are traditionally used as inert carriers in a cosmetic and pharmaceutical industry. Mechanical activation of kaolinite, for example, is known to produce both basic and acid active centers. Therefore, it is interesting to study solid-state reactions of the natural silicates with aminoacids and hydroxyacids, compounds containing carboxyl, amino and hydroxyl groups and therefore capable to form salts with both bases and acids.

The carried out studies of mechanochemical activation of natural silicates (kaolinite, talc) layered with solid aminoacids and hydroxyacids by methods of IR spectroscopy and DXR confirm the formation on a surface of the silicate of active centers of basic character which interact with acids. As result, strong chemical bonds between silicates and acids was formed. It was found that during the mechanochemical activation of individual acids, a shear deformation takes place along slip planes, which produced no considerable distortions in the nets of strong hydrogen bonds. The weak interlayer bonds in the blocks of acid appear to break down easily during activation, but are rapidly restored after unloading.

The time space and the character of interaction depending on a nature of an acids are considered.

On the basis of this researches the technology of obtaining of new medical cosmetics is developed. The characteristic properties of medical cosmetics are depending on homogeneous distribution of biologically active constituents in inert dissolvent that is reached by means of the mechanochemical interaction.