

CLAY MATERIALS AND THEIR PROPERTIES

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Medical and pharmaceutical scientists are increasingly turning to the use of natural materials to treat diseases of internal organs and skin. The interest of scientists to the unique properties of clay minerals is not only reduced today, but is growing. The peculiarity of clay application is its efficiency and availability.

Clays are fine sediments consisting of small crystalline particles of clay minerals (montmorillonite, kaolinite and mixed-layer formations of size less than 0.01 mm and the largest aleurite (0.01 - 0.1 mm) and sand (0.1 - 1.0 mm) grains of quartz, feldspar, calcite, gypsum, iron oxide films and other minerals. In clays there is more than 50% of fine particles. They lie as a layer and deposits are developed open-cast.

Clay is a silica-alumina mixture containing silicon, aluminum, manganese, titanium, potassium, calcium, beryllium, iron, gallium, copper, cobalt, molybdenum.

Montmorillonite dust by its chemical composition represents hydroxyl aluminum silicate, containing alkali and alkaline metals. Its structural formula is: $Al_2Si_4O_{20}(OH)_2 \cdot 2H_2O$ where Al can be partially replaced for Na, K, Ca, Fe, Mg.

It has been proven that to obtain the necessary ointment-like consistency Na - form - 13%, K - form - 19%, Mg - form - 31%, Ca - form - 38%, and H - form - 40% are required.

Therefore, we have attempted to get Na – form of Bentonite from Ca - form of montmorillonite.

When using bentonite clay in pharmaceutical practice, great importance has the removal of sand and ballasts from clay. This is achieved firstly by more detailed selection of the cleanest samples, secondly, by sludging out, ie washing with purified water to completely remove coarse particles and sand from clay. Sludging out is conducted by a special technique (see. Table.)

Bentonite purification by sludging out.

Coarse particles and sand content, %				
Before sludging, %	Single sludging, %	Double sludging, %	Triple sludging, %	4 times sludging, %
19,2	6,4	31,1	0,2	0,2

n=5

The analysis has shown that 5 times sludging provides required purity. After that bentonite is filtered and dried at $t^\circ - 110^\circ C$.

Double-sludged fraction is taken for further investigation.