

The role of stabilizers in the creation of oral suspensions

Melnyk G., Yarnykh T., Yuryeva G.

Department of Drugs Technology

National University of Pharmacy, Kharkiv, Ukraine

tl@nuph.edu.ua

Suspension is a liquid dosage form containing in the dispersed phase one or more crushed powdered substances distributed in the liquid dispersion medium. Suspensions as microheterogeneous systems belong to unstable systems and therefore, over time, stratify. The rate of sedimentation of solid phase particles depends on measures of their dispersion and is reflected in Stokes' law.

Thus, the stability of the suspension is directly proportional the viscosity of the dispersion medium, inversely proportional to the square of the diameter of the suspended particles, the difference between the density of the dispersed phase and the dispersion medium and the acceleration of gravity. Therefore, some values can be influenced in the direction of achieving maximum stability of suspensions.

An expedient and easily feasible solution to the problem of the suspensions stabilization in a pharmacy condition is to reduce the solid particle size of the suspended medicinal substance. For this reason, in the manufacture of suspensions, the solid phase is subjected to dispersion, i.e. grinding in a mortar in a dry form or by adding a liquid that facilitates the grinding process and makes it possible to obtain particles of a smaller size. Thinning of the suspended phase due to an increase in its specific surface area, and, consequently, the area of contact with the surface of diseased tissues, the gastrointestinal membrane, etc., simultaneously increases the therapeutic activity of the suspension. A thin suspension is not only stable, but also a drug-active suspension.

The second approach in the suspension stabilization is to use a stabilizers. Substances that increase viscosity and density are products of natural and synthetic origin. In this case the stability of suspensions increases when a so-called solvation shell forms on solid particles, which prevents them from sticking and precipitating. The formation of such shell is greatly facilitated by adding to the dispersion medium a suspension of a small amounts of surfactants that are soluble in it. In this case, the latter, being adsorbed on suspended particles, make it possible to form a solvation shell around the particles of the dispersed phase.

Stabilizers are low molecular weight electrolytes, colloidal surfactants and high molecular weight substances. Most often used gum, pectin, starch, agar, sodium alginate, aerosil, gelatin, derivatives cellulose, carbomers and others.