Krzysztof Papuga et al., J Geol Geophys 2017, 6:6(Suppl)
DOI: 10.4172/2381-8719-C1-015

Sedimentation method for determining the content of soil fractions with diameters from 0.05 to 1.0 mm

Krzysztof Papuga and **Jarosław Kaszubkiewicz**
Wrocław University of Environmental and Life Sciences, Poland

The most common methods used for determination of the granulometric composition of soils are based on the phenomenon of sedimentation. They use varying velocity of falling of soil particles in function of their substitution diameters. The existence of such dependence allows separates the particles of different dimensions in the process of their fall in the aqueous suspension. The sedimentation method has used only for particles less than 0.1 mm in diameter due to the shortfall time of larger particle sizes on the bottom of the vessel in which the sedimentation takes place. The proposed solution allows to circumvent this problem and determine even fractions up to 1 mm by sedimentation. In a vessel with water, a float (denser than water) is suspended onto a sensitive piezoelectric dynamometer. The use of such a dynamometer allows the density of the suspension to be measured at a predetermined depth. A layer of sand is added to the surface of the water (fractions from 0.05 to 1.0 mm) with a special device. Falling sand grains are separated by the effect described above and passing beside the float causes their apparent weight to drop, recorded by the measuring system connected to the dynamometer. The dependence of the apparent weight of the float on time allows calculating the content of different sand fractions. The amount and dimensions of the measured fractions depend on the geometry of the float and on the depth of its draft in the suspension. The correct algorithm requires the smoothing of the measuring curves. Appropriate summation of the calculated fractions enables the determination of the content of grains with diameters falling within the typical compartments used for the determination of granulometric composition. The method was tested for soil types with different granulation. The entire measurement lasts only about 100 seconds. The obtained results are satisfactory in accordance with the sieve method.

Biography

Krzysztof Papuga is a PhD student at the Faculty of Life Sciences and Technology, Wrocław University of Environmental and Life Sciences. In 2016, he completed his Master's degree in Environmental Protection, specialized in Environmental Risk Management.

krzysztofpapuga@vp.pl

Notes: