Characterization of Aerodispersed Systems with Increased Concentration According to the Kinematic Viscosity and Mass Density of their Aerosol Phase

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Aerodispersed systems, hereinafter referred to as aerosols are an integral part of the natural environment of man. Such are the condensation clouds and fogs, dust clouds in deserts and those caused by volcanic activity. Aerosols are widely used in industry, agriculture, medicine, military science. Therefore, the study of their properties is an essential necessity. If the concentration of their aerosol phase is increased, they possess certain physical properties similar to those of liquids, for example the ability to flow.

The current article offers a laboratory method for the determination of the kinematic viscosity and mass density of concentrated aerodispersed systems formed in a limited volume. This method is based on measuring the time required for a certain amount of aerosol to flow out through a calibrated outlet pipe under the influence of its own hydrostatic pressure. This method uses the Poiseuilles law and the equation of continuity. he time needed for the aerosol to flow out is determined by monitoring its upper limit "aerosol-air" using a laser system and photoelectric sensors and is based on the scattering of laser light by the aerosol.