Determination of Size and Concentration of Water Droplets in Experiments with Wilson Chamber

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The processes of water evaporation and condensation play a defining role in many atmosphere phenomena. Kinetics of condensation determines the character of the development of such phenomena as thunderstorms and tornado. For experimental verification of theoretical models of condensation processes experimental setup was created, based on Wilson's chamber. Visual supervisions of the condensation process permitted to suppose that the higher initial pressure in the chamber is, the more drops are in the volume unit, and the less their size is. The size and concentration of drops are calculated according to the results of measuring of the weakening of the detector signal that registered the dispersion of laser ray on drops and the temperature inside the chamber. For the dynamic temperature measurement the circuit consisting of amplifier thermocouple, precision operational amplifier and two thermocouples chromel-alumel was developed. By use of this circuit research of the dependence of thermal inertia index of thermocouple diameter was held and the technology of application of thin thermocouples in the experiments was worked off. There were experiments in determination of the size and droplets concentration, condensed in the chamber. The obtained data are used for verification of the theoretical model of the kinetics of condensation.

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