

CYLINDRICAL CHAMBER FOR ION
CONCENTRATION CONTINUOUS MEASUREMENT

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The problem of aerosol particles measurement by the small-ion accumulation method^{1,2} are discussed with the aid of theoretical and experimental data. A simple model is developed for quantitative relations among different parameters which are important for differential ionisation chamber designs. Sensitivity for different concentration and average distribution of particle size is established experimentally. The working point found in this way lies in the upper half of non-saturation area of characteristic curve. In particular the influence of the condensation nucleus density and air flowing in sensitive volume of chamber is examined. In practice the average particle size is difficult to determine, so that accurate calculation of the particle concentration is difficult, but in case of particle size distribution remaining constant during the measurement, relative value can be obtained with high accuracy. Specially designed chamber makes diffusion movement of aerosol particles possible, eliminating correction factor which is usually difficult for determination. Loss of ions to the polydisperse aerosol by bipolar ion diffusion is defined by attachment coefficient and for given distribution of particle radius being complicate function it is necessary to take approximation. Theoretical formulation and experimental evaluation show that ion-current characteristics for different concentration of particles represent lines originating from the same point.

- 1) V.A.Mohnen, Atmospheric Environment Pergamon Press, 5,137 (1971)
- 2) J.P. Rosemann, Staub-Reinhaut, Luft 32 (1972)