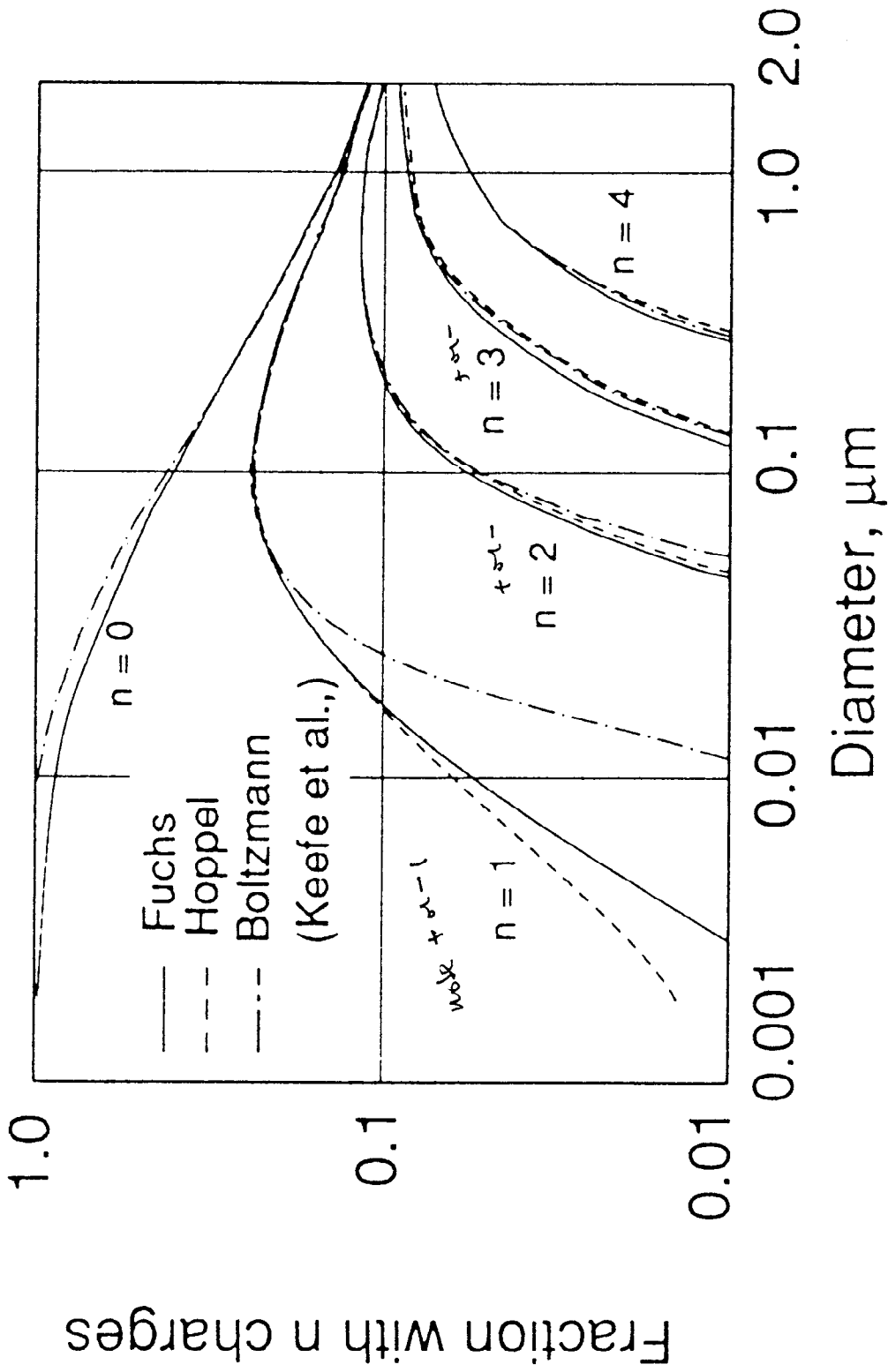


FIGURE 15.6 Particle charge limits. Rayleigh limit for water ($\gamma = 0.073 \text{ N/m}$ [73 dyn/cm]), diffusion charging at $N_i t = 10^{13} \text{ s/m}^3$ [10^7 s/cm^3] and field charging at $E = 500 \text{ kV/m}$ [5 kV/cm] and $N_i t = 10^{13} \text{ s/m}^3$ [10^7 s/cm^3]. $\epsilon = 5.1$.

TABLE 15.4 Distribution of Charge on Aerosol Particles at Boltzmann Equilibrium

Particle Diameter (μm)	Average Number of Charges	Percentage of Particles Carrying the Indicated Number of Charges												
		<-3	-3	-2	-1	0	+1	+2	+3	>+3				
0.01	0.007				0.3	99.3	0.3							
0.02	0.104				5.2	89.6	5.2							
0.05	0.411			0.6	19.3	60.2	19.3	0.6						
0.1	0.672		0.3	4.4	24.1	42.6	24.1	4.4	0.3					
0.2	1.00	0.3	2.3	9.6	22.6	30.1	22.6	9.6	2.3	0.3				
0.5	1.64	4.6	6.8	12.1	17.0	19.0	17.0	12.1	6.8	4.6				
1.0	2.34	11.8	8.1	10.7	12.7	13.5	12.7	10.7	8.1	11.8				
2.0	3.33	20.1	7.4	8.5	9.3	9.5	9.3	8.5	7.4	20.1				
5.0	5.28	29.8	5.4	5.8	6.0	6.0	6.0	5.8	5.4	29.8				
10.0	7.47	35.4	4.0	4.2	4.2	4.3	4.2	4.2	4.0	35.4				



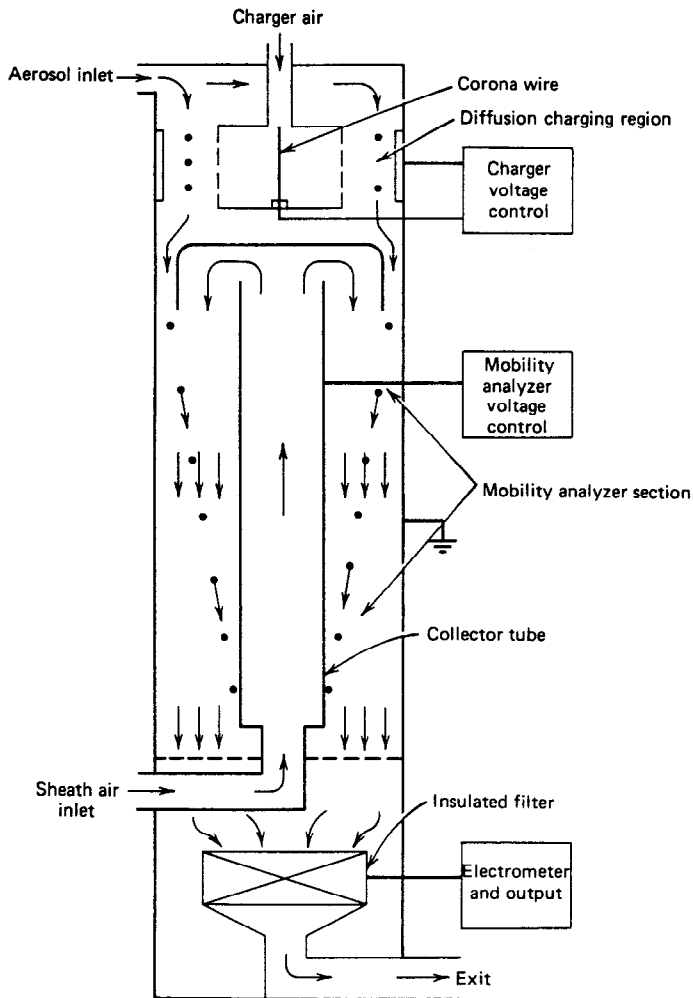


Figure 15.12 Schematic diagram of electrical aerosol analyzer

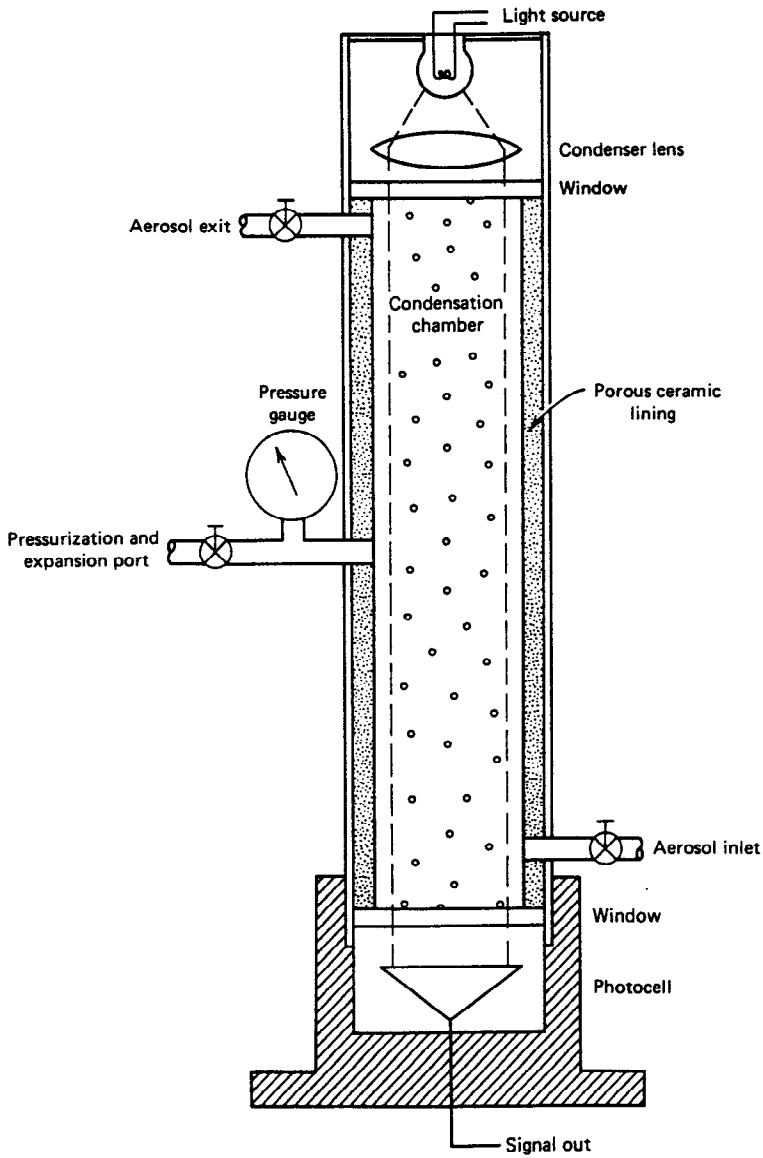


Figure 13.8 Schematic diagram of a manually operated condensation nuclei counter.

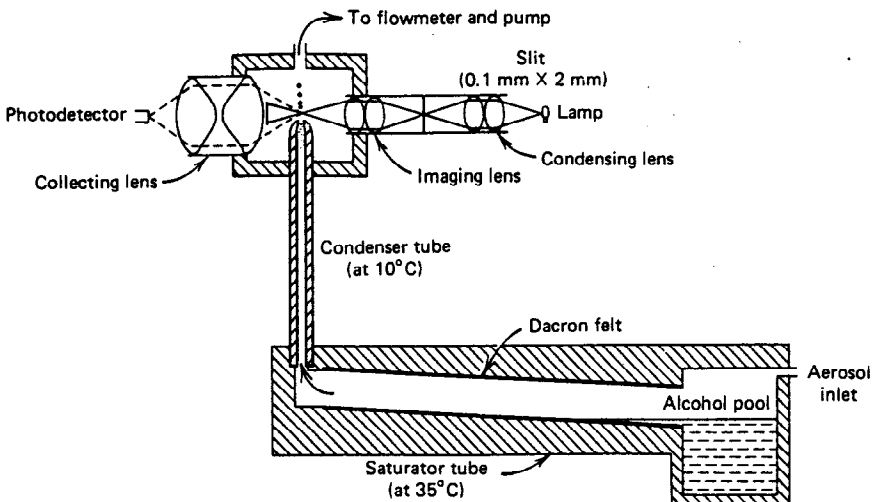
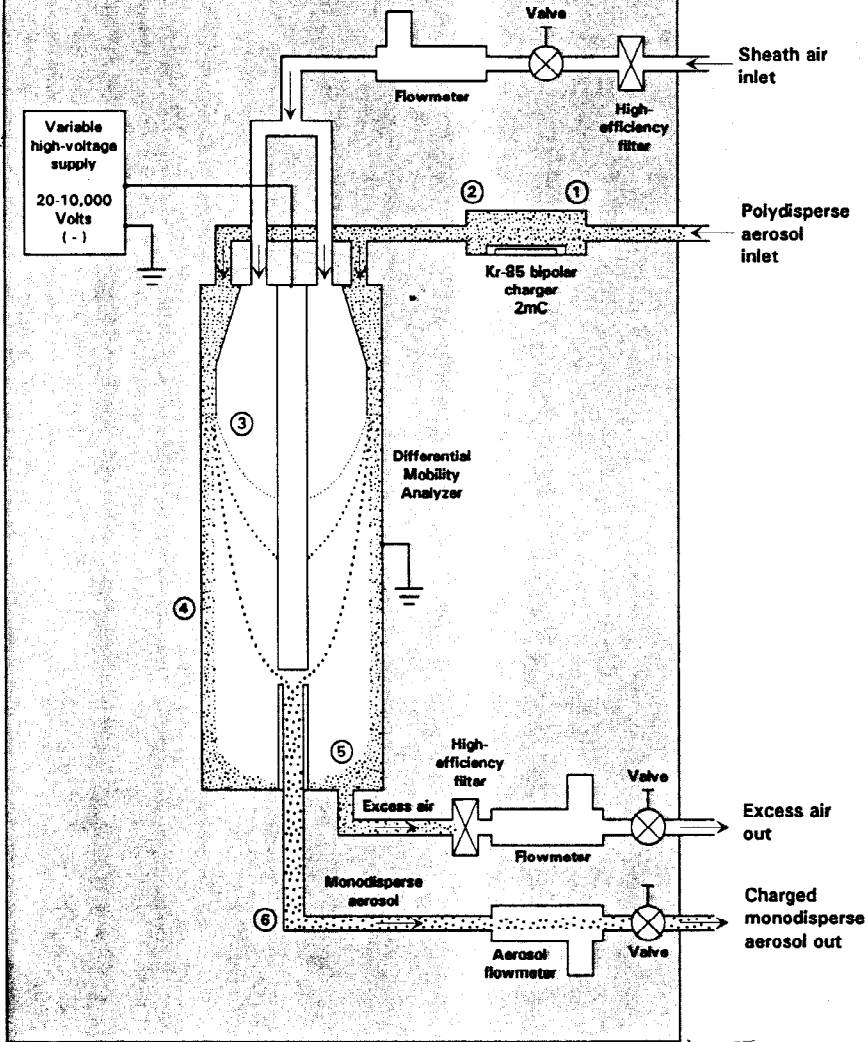


Figure 13.9 Schematic diagram of a continuous flow condensation nuclei counter. Reprinted with permission from Agarwal, J. K., and Sem, G. J., *J. Aerosol Sci.*, 11, 343 (1980).

Model 3071 Electrostatic Classifier

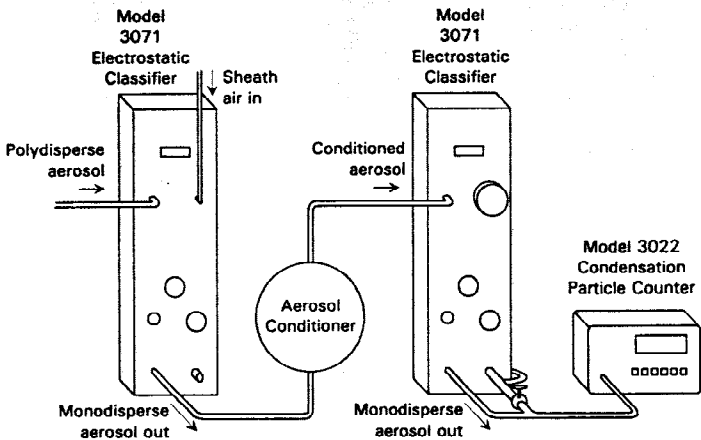


*D. Flourens
Mobility
Analyzer*

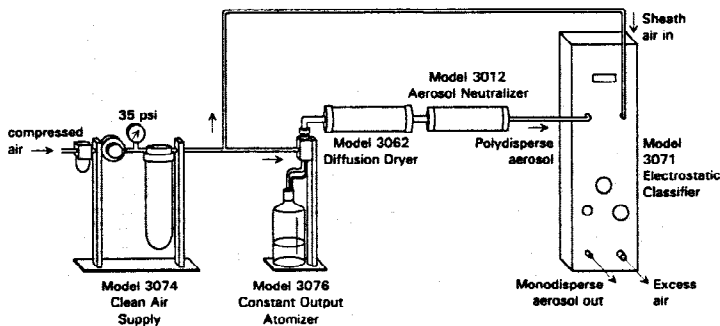
Inside the Model 3071

- ① Polydisperse aerosol enters the bipolar charger.
- ② Particles achieve an equilibrium charge level.
- ③ The center rod attracts positive particles.
- ④ The center rod repels negative particles to the wall.
- ⑤ Uncharged particles exit with the excess air.
- ⑥ Positively charged particles of a single mobility exit as monodisperse aerosol.

~ 24,000



Electrostatic Classifiers used in tandem to measure small changes in particle size. The first Model 3071 serves as a monodisperse aerosol generator; the second as a particle sizer.



Monodisperse Submicrometer Aerosol Generation system (TSI Model 3940) for various aerosol research projects, particle counter calibrations, and filter media tests.