

These results show that all four instruments collected essentially equal amounts of material. This was to be expected, since the precipitating potential and air flows were maintained as nearly equal as possible. Any difference in the amount of material collected is believed due to unavoidable variations in the air flow or voltage.

EFFECT OF POLARITY

A further series of tests were made to determine the effect of polarity on the amount of material collected. Two PHS-50's were used, one operated positive and the other negative, and these were tested simultaneously with the PS-10, which was positive in some tests and negative in others. The tests were conducted under the same conditions as described previously. The results are shown in table 2.

The negative corona appears much brighter to the eye than the positive, and the conclusion might be drawn that the negative corona effects better precipitation. This supposition was not borne out by the limited data obtained.

TABLE 2.—Comparison of Material Collected with Positive and Negative Polarity

Test	Material Used	Operating Voltage, Kv.	Sampling Rate, Cu. Ft. per Min.	Sampling Time, Min.	Volume of Air Sampled, Cu. Ft.	Weight of Material Collected, Mg., with Indicated Instrument and Polarity of Center Electrode			
						PHS-50 Pos.	PHS-50 Neg.	PS-10 Neg.	PS-10 Pos.
1	Lead oxide	13.5	3	60	180	46.3	46.7	47.4	....
2	Lead oxide	13.6	3	60	180	30.0	29.4	30.4	....
3	Lead oxide	13.7	3	30	90	46.6	47.1	45.6	....
4	Lead oxide	13.8	3	30	90	18.2	18.9	18.4	....
Totals.....		....	..	180	540	141.1	141.1	151.8	....
5	Lead oxide	13.5	3	30	90	27.9	25.8	....	27.7
6	Lead oxide	13.5	3	45	135	33.5	29.3	....	34.1
7	Lead oxide	13.5	3	15	45	4.3	3.4	....	4.2
Totals.....		....	..	90	270	65.7	58.5	....	66.0
8	Chromate dust	13.5	3	45	135	37.2	39.9	39.1	....
9	Chromate dust	13.5	3	30	90	19.1	19.0	19.8	....
Totals.....		....	..	75	225	56.3	58.9	58.9	....

SUMMARY

A new power supply using radio frequency has been described which will fit in the old M. S. A. case. This power supply weighs only 2¾ lb. (1.24 Kg.) and can be constructed for about \$35.

Laboratory tests showed collection efficiencies comparable to those of other instruments now in use. Lead and zinc oxide fume and a residue dust from a chromate plant were used for these tests. A limited number of tests showed no essential difference in collection efficiency when the polarity was reversed.

The instrument has not been subjected to field tests but was operated in the laboratory for over 150 hours, including 8 hours a day for four consecutive days. There was no indication of any breakdown of parts during this time.

APPENDIX

LIST OF PARTS FOR PHS-50 POWER SUPPLY

- 1—15 kv. radio frequency coil (Spellman Television Company, Inc., 3029 Webster Ave., New York 67)
- 1—R. F. filament transformer (Spellman)
- 1—1B3GT tube
- 1—6L6G
- 1—Ceramic octal socket
- 1—Bakelite® octal socket