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cc: 1. R.E. Curtis
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TO: R. E. CURTIS

FROM: A. P. STEHNEY and R. E. KITSON

RE: Summary of the work done by the Ion Development Group, September 15, 1944 to June 1, 1945.

A. Major Development Jobs

1. Development of methods for X. Three methods were developed. A colorimetric method, based on work at Site C, a titrimetric method based on previous published work of P.L. Kirk, and a titrimetric method based on the mercury cathode work of James Fentress.
2. Several months of investigation were given to various drop scale procedures for fluorine. No method, suitable for routine control was developed.
3. The tetraiodobismuthite method for bismuth in all plant samples was developed. It has been particularly useful in bismuth analyses, both in the control and special analysis laboratories.
4. Methods for the determination of nitric oxides in stack gases were investigated. A large number of temporary methods were written covering various analyses based on this work.
5. The effect of pH, and of mixtures of iron and aluminum, on the existing aluminum procedures was investigated.
6. It was shown that zirconium in zirconium phosphate could be determined by the existing zirconium method.
7. Methods for the determination of lanthanum and sulfate in certain plant samples by a volumetric method were devised.
8. A method for the determination of milligram quantities of hydroxyl ion in coating removal samples was developed.
9. A method for the determination of microgram amounts of hydroxyl ion in coating removal solutions was developed.
10. Semi-quantitative and quantitative methods for hydrazine were developed for use with plant samples.
11. A spectrophotometric method for sulfate on 221 and 231 plant samples was devised.
12. Several semi-quantitative methods for lead were improvised.
13. A procedure for the determination of lanthanum on 224 plant samples was devised, but it has had little value because of the wide variety of unexpected impurities in the samples to be analyzed. A procedure for small amounts of lanthanum in 224 solutions was developed for the analysis of picked solution. Development work on a method for traces of lanthanum has yielded negative results.
14. A study of the effect of pH on the color of potassium dichromate solutions has been made.

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15. Two dropscale procedures for the determination of hydroxylamine in 224-231 process solutions was developed.
16. A method for the determination of potassium has been modified and improved for use in the 231 process.
17. Determination of nitrate titrimetrically. Some work, never too successful, was done.
18. The existing method for chromium III was modified to give a more stable color.
19. In connection with the analysis of plant sample, the effect of XNH on the null-point method for H in XNH solution was studied.
20. A complete revision was made of the null-point method for hydrogen in X containing samples.
21. Developed semi-micro method for Iron in 100 Area water.
22. Investigated existing procedures for chromium in 100 Area water.

B. Special Services to the Area Laboratories

1. The entire Ion Analysis manual has been written and revised as necessary.
2. Numerous procedures and experimental techniques have been demonstrated to either 222 or 231 laboratories (Zirconium, hydrogen ion, X, fluoride semi-micro, sulfate, hydrazine, and the primary sampler).
3. Special ion analyses on plant samples, both hot and cold, at the request of the 222 laboratory. Analyses run include all the H and X analyses on the February and March runs in 221.

Other analyses run on request include lanthanum, zirconium, hydrogen, X and sulfate.

C. Special Services to the Laboratories Division

1. Virtually all the micro equipment for the division has been stocked and dispensed by the group through Room 7.
2. All spectrophotometer servicing, including supply of spare parts, until February 1 was handled by the group.
3. Monitoring and dishwashing services for the Laboratories in 3706 have been operated by the group.
4. Remote control apparatus for the handling of hot samples was assembled and demonstrated to the group.

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