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OTS: 60-31,177

JPRS: 3399

6 June 1960

19990430 130

ACHIEVEMENTS OF ANALYTICAL CHEMISTRY IN CHINA

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### FOREWORD

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JPRS: 3399

CSO: 3611-D

## ACHIEVEMENTS OF ANALYTICAL CHEMISTRY IN CHINA

Following is a translation of an article by D. I. Ryabchikov in Zhurnal analiticheskoy khimii (Journal of Analytical Chemistry), vol. XV, No. 1, Jan/Feb 1960, Moscow, pages 127-128.

In the Chinese Peoples Republic in 1952 a vast network of analytical laboratories was created in the specialized, newly opened Institutes of the Academy of Sciences and Departments, and in their affiliated branches in the provinces (under the control of the university chemistry departments), at geological-survey party working sites and later, even in the peoples communes. Chemical processes, which at first had been applied preferentially under the control of industry, have been replaced more and more by the most exact and fast instrument processes. Equipment, designed for small district laboratories, is being made for mineral analysis. The mass preparation of field laboratories was initiated.

Analytical control has been widely realized in the development of flow processes, technological refinement of ores and particularly, extraction of non-ferrous and rare metals. As a rule, all new industrial enterprises are equipped with good analytical laboratories.

The importance of controlling analytically the production and quality of the finished product in all areas of industry and agriculture was reflected at the All-China Industrial and Transportation Exposition in Peiping at the end of 1958, and at the Agricultural Exposition in January 1959. Chinese-made samples of modern laboratory equipment were displayed at the exposition. They included high quality analytical weights, photocolorimeters, polarographs, spectrographs, electric heaters, glass and chinaware and a very large assortment of reagents (up to 5000 items). These were all made in the newly constructed industrial enterprises and experimental workshops controlled by the scientific research institutes and universities.

The wide range of analytic endeavors in the land demanded the solution of the cadre problems. Analyst cadres had not been developed in the sparse universities of old China. In 1952 analytical chemistry professorships were created by carrying out educational reforms in the university chemistry departments. The training of analyst cadres takes place in China at the universities and specially created secondary and higher schools, at the chemical geological and metallurgical institutes of the Academy of Science. Analytical chemistry research is beginning to be more widely developed in the analytic chemistry professorships and analytical laboratories of the chemical institutes of the Academy of Science and its departments. Systematic work in the creation of simplified soil, fertilizer, iron ore, steel and copper analysis methods for the

laboratories of the peoples communes is interesting.

Training laboratories of the chemistry departments are well supplied with the necessary equipment, instruments and reagents. Libraries of the departments and scientific research institutes are well stocked with literature. Many Soviet textbooks are published in the Chinese language. Fundamental foreign reference books are duplicated by photo-offset and filed in the library of the land.

In connection with the exploitation of new techniques, methods for determining impurity traces in extra pure metals and compounds are being successfully developed and assimilated.

In their studies Yen Jeng-Ying (Peiping University), Liang Shu-Chuang, (Institute of Chemistry of the Academy of Sciences) and Yung Shu-Shang shan (Institute of Applied Chemistry of the Academy of Sciences) further developed the classic methods of precipitation, co-precipitation and separation of elements suitable for concentrating and determining inorganic components. Chung Yu-Lans (Institute of Chemistry of the Academy of Sciences) efforts in microchemical analysis methods were initiated in this same direction.

Tsong Yung-Hua created a polarographic analysis group at the Institute of Applied Chemistry of the Academy of Sciences in Chang Chun followed by Liu Chen-I in Peiping soon after the liberation; three years later this method was widely applied in the land. Studies of the polarographic theory are being conducted by Kao Hsiao-Hsia at Peiping University. In recent years studies of oscillographic polarography have been initiated. In a number of institutes work is being successfully conducted in the creation of new forms of polarography. Recently the chromatographic method for separating complex mixtures of matter and extracting extra pure preparations of scarce and rare earth elements has been widely applied. Particularly in this regard the efforts, directed by Tsung Huang-Peng at the Institute of Applied Chemistry in Kingkung (?) and by Liu Ta-Kang at the Institute of Chemistry in Peiping ought to be noted.

Efforts have been successfully carried out in the synthesis of domestic brands of ionites, in particular at the Chemistry Institutes and the Institute of Applied Chemistry of the Academy of Sciences. The chromatographic and electrochromatographic method on paper was applied with success to analyze rare earth elements, and at Hsinmin University, Lu Tsung-Lan and Huang Yu-Ying used this method to determine micro-quantities of alkali metals.

Spectrographic analysis methods have found especially wide dissemination in connection with the express-analysis of steel and nonferrous metals. Wu Hsueh-Chou directed many-sided investigations in spectroscopy at the Institute of Applied Chemistry of the Academy of Sciences in Changchun.

Excellently equipped spectral analysis laboratories exist in a number of academic institutes (Institute of Geology, Chemistry in Peiping Institute of Metallurgy and Ceramics in Shanghai; in the Ore-metallurgical Institute in Changsha and other institutes), universities and

factories. At first the necessary apparatus was imported into China from the Soviet Union, the G.D.R. (German Democratic Republic), and England; recently in China the proper production of spectrographs was organized on the basis of the models developed at the Optical Glass Institute in Changchun.

In a short time in China analytical chemistry has come to occupy its proper place in solving vitally important problems in the most diverse areas of science and techniques. An excellent material-technical base has been created, numerous analyst cadres have been trained, and under the great attention of the Communist Party and People's Government of China the chemical-analysts will with honor, master the massive tasks, decreed by the Second Five Year Plan for the development of the national economy of China.

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