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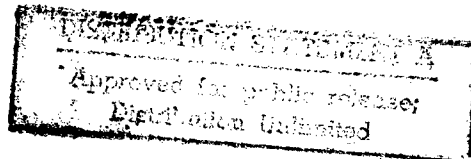
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CONFERENCE ON THE USE OF ION EXCHANGE RESINS  
IN HYDROMETALLURGY AND MACHINE BUILDING

- USSR -

by A. I. Sinel'nikova



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[Following is a translation of an article by A. I. Sinel'nikova in Izvestiya Vysshikh Uchebnykh Zavedeniy - Tsvetnaya Metallurgiya (News of Higher Educational Institutions - Nonferrous Metallurgy), No 1, 1960, pp 165-166.]

In July 1959 a conference on the use of ion exchangers in industry<sup>1</sup> was held in the Moscow conference hall of the State Scientific Committee of the Council of Ministers USSR; it was called by the Mining Institute of the Academy of Sciences USSR (AN SSSR), the Institute of Nonferrous Metals (Moscow), the State Scientific Research Committee of the Council of Ministers USSR, the State Committee on Chemistry of the Council of Ministers USSR, and the Commission on Chromatography of the AN SSSR.

About a hundred persons from 39 organizations took part in this project. There were representatives from the institutes of the AN SSSR, universities, branch scientific research institutes, planning organizations and plants of Moscow, Leningrad, Gor'kiy, Novosibirsk, Krasnoyarsk, Noril'sk, Severoyeniseysk, Tavda, Krasnoarmeysk, from the Ministries of Finance and Sanitation, the GNTK of the RSFSR, the Mint, the Moscow and Krasnoyarsk Council of National Economy, and others.

At the conference reports were heard from the following persons: K. M. Saldadze, director of the Scientific Research Institute of Plastics laboratory, on "The Prospects of Synthetic and Industrial Production of Resins", I. N. Plaksin, A. I. Sinel'nikova, A. Yu. Beylin, associate members of the AN SSSR, on "The Application of Ion Exchange

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<sup>1</sup> The first conference on the application of ion exchange took place in Moscow in June 1956. See materials of the Conference on the application of ion exchange resins in nonferrous metallurgy. M. 1957.

Resins in the Hydrometallurgy of Noble Metals", I. N. Plaksin and A. A. Korobkin on "The Application of Ion Exchange Resins in the Sorption of Platinic Metals from Hydrochloric Solutions", I. N. Plaksin, N. A. Suvorovskaya, V. V. Shikhova, and G. I. Lopatina on "The Application of Ion Exchange Resins in the Hydrometallurgy of Rare Metals", I. D. Fridman and I. N. Yudina on "The Extraction of Niobium and Zirconium from Solutions by the Ion Exchange Method", Ye. V. Ganushkina, Candidate of Technical Sciences, Head of the NII Agricultural Tractors Machine-Building Laboratory, on "Prospects for the Industrial Application of Ion Exchange Resins in Machine-Building for the Purification of Waste Waters from Galvanization Plants and for the Reactivation of Electrolytes".

The reporters pointed out that the extensive development of polymer chemistry opened new possibilities and trends in the development of hydrometallurgical processing of nonferrous, noble, and rare metals, in the purification of waste waters and spent solutions in various fields of machine-building.

The creation of a wide assortment of ion exchange resins makes possible a more complete extraction of metals from ores of complex composition and various metallurgical products. The known methods of chemical purification do not always yield positive results. In addition, they are usually expensive, include a large number of operations, and require cumbersome equipment. Besides, chemical purification brings about the loss of valuable components and calls for expensive reagents.

The method of sorptive lixiviation, i. e., cyanidation with simultaneous sorption of the metal by a resin is an especially noteworthy process developed by the Moscow Institute of Nonferrous Metals. This method cuts the time of cyanidation and increases the amount of metal extracted, in particular of silver which is lost with cyanidation residues.

The economic efficiency of ion exchange is determined by the removal of the following difficult operations from the technological processing scheme: concentration of solutions by evaporation, filtration, condensation of pulp, and cementation; besides, metals and demineralized water return to the process.

Scores of technological schemes for different types of raw materials have been worked out in applying ion exchange resins along the above mentioned lines.

The following took part in the discussion of the reports: A. I. Subbotina (Gor'kiy University), M. M. Senyavin (Geochemical Institute of the AN SSSR), M. B. Ferberg (Noril'sk Mining Metallurgical Combine), A. B. Davankov (Moscow Institute of Chemical Engineering), S. M. Chernobrov (Mekhanobr), S. I. Kayukov Sibtsvetmetniiprojekt, Krasnoyarsk), Ye. P. Bogomil'skaya (All-Union Scientific Research Institute of Hard Alloys), N. M. Sukhoret'skaya (GNTK SSSR), A. G. Yermonina (Gor'kiy Auto Plant), M. S. Girdasov (TsNIGRI), and others.

In their reports the participants of the conference pointed out qualitative and quantitative deficiencies in the output of resins and the absence of experimental set-ups for checking the results of experiments.

It was pointed out that research on the application of ion exchange resins in hydrometallurgy and machinebuilding is undertaken by scores of organizations, whereas the exchange of results and experience is lacking. Organizations beginning research are thus constantly repeating previous mistakes. The computation of the technological and economic indices of the processing is also poorly managed.

The participants of the conference accepted a series of resolutions aimed at raising the quality and quantity of the resin output and at creating favorable conditions for the acceptance of ion exchange resins in industrial applications. The following were deemed necessary in the final resolution:

1. To organize as soon as possible the output of ion exchange substances (anion and cation exchangers) in such quantities as to guarantee an adequate supply for experimentation on a semi-industrial scale, paying a particular attention to the output of those resins which possess selective properties and various contents of supporting material.
2. To appeal to the Gosplan USSR to make a provision in the seven year period for supplying non-

ferrous metallurgy and machine-building with ion exchangers following the necessary preliminary orientation agreed upon at the conference.

3. To appeal to the State Committee on Chemistry of the Council of Ministers USSR to provide scientific research institutes and organizations with the necessary amounts of ion exchange resins in the proper assortment, and to set up experimental installations producing the necessary amount of new ion exchangers with the purpose of testing their quality in semi-industrial conditions while working out technological processes.

4. In order to improve the supply of industry with the necessary assortment of resins, to improve cooperation among organizations synthesizing ion exchangers and those using them in metallurgical and machine-building technology.

5. To commission the Mining Institute of the AN SSSR and the Institute of Nonferrous Metals (Moscow) to head projects furthering the application of ion exchange resins in the metallurgy of nonferrous, noble and rare metals. To ask the same of the Scientific Research Institute of Agricultural Tractor Building in machine-building.

It is hoped that the Organizational Bureau of the Conference and the acting commissions will see to the execution of these decisions as well as to those which were set down at the first conference on ion exchange in 1956.

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