

RESOURCES

Aluminum From Many Sources Intensely Considered By WPB

Processes Involving Alunite and Low Grade Bauxite Have Been Studied for Months by NAS

THE War Production Board which recently has approved the production of aluminum from clay is also intensely considering several processes involving not only clay, but alunite, low-grade bauxite and other domestic sources in the event that our supplies of high-grade bauxite from British and Dutch Guiana, which has accounted for 60% of our whole supply, may be greatly diminished or wholly cut off by the U-boat warfare in the Caribbean Sea.

These processes have been investigated for more than a year by scientists of the National Research Council of the National Academy of Sciences, and a report has been made at the request of the WPB by Dr. Zay Jeffries, chairman of the Metals Conservation and Substitution Group of the Advisory Committee on Metals and Minerals.

All the aluminum in this country has been made until now from high-grade bauxite (containing less than 7% of silica) by the Bayer process, which is the cheapest way, provided high-grade bauxite is available. But this process does not extract all of the alumina (aluminum oxide) from even the best of ore, and the poorer the ore, the greater the waste and the greater the expense for chemicals.

The clay processes can be used in two ways, the committee found. Aluminum oxide (alumina) can be extracted directly from the clay, or silica can be partially removed from high-silica (low-grade) bauxite to convert it to low-silica bauxite which can then be treated by the Bayer method. In either case the metal is then extracted by electrolysis.

The tailings, thrown out by the Bayer plants, called red mud on account of its color, can be considered as clay, the committee pointed out, and the clay process applied. They recommended that clay-reducing plants be added to existing Bayer plants. High-silica bauxite can then be fed to the Bayer plant which will remove about 70% of the alumina and the clay process applied to the tailings will get most of the rest.

In particular the committee recommended that the clay process be applied to the millions of tons of red mud that has accumulated during the past thirty or more years at the East St. Louis plant of the Aluminum Company of America. This mud contains as much alumina as is contained in 1,000,000 tons of bauxite. It also contains large quantities of lime and soda, materials used in both the Bayer and the clay processes. The proportion of alumina to silica is higher than in kaolin clay which is almost pure aluminum silicate. It is good aluminum ore. It is already mined and pulverized, and contains a part of the materials needed for its own reduction. There's half a million tons of aluminum in that thar hill.

AGRICULTURE

Four Argentine Scientists To Study Farm Products Uses

Two Are Interested Particularly in Farm Waste Use; Making of Industrial Products from Corn Studied

GOOD neighborhood and good agriculture alike will receive encouragement from the research sojourn of four Argentine scientists in this country, in a preliminary survey of industrial utilization possibilities of farm crops and wastes.

Three of the men are already in the United States. They are Carlos Clementino Zarate and Oscar Saturnino Mallea of the University of Santa Fe, both of whom are especially interested in problems of farm waste utilization; and Dr. Enrique Duprat of the University of Buenos Aires, who will look into possibilities of industrial products from corn and wheat. At the end of the month they will be joined by Jose Baiarlado,

There are two kinds of clay process, the acid and the alkaline. The committee favors the latter which consists in the main in mixing the clay with lime and soda, sintering and washing. The Tennessee Valley Authority has been experimenting for the past five years with an acid process applied to white kaolin clay, but the committee finds that the alumina it produces is not as yet sufficiently pure. However, the TVA is continuing its investigations and hopes to perfect the process.

Finally alunite or alum stone, a common mineral, is another source of aluminum. The reduction requires sulfuric acid, a substance for which there are enormous other demands in the war effort. But the stone is composed mostly of potassium-aluminum sulfate, so that the acid can be made from the sulfur present in the mineral.

Next to low-silicon bauxite the best ore for aluminum is high-silicon bauxite, and the best use of the clay process is in connection with a Bayer plant, the committee concluded. Meanwhile search for new domestic sources of bauxite should be vigorously continued. There are no known deposits in Mexico or Canada.

Science News Letter, August 15, 1942

chemical engineer of the University of Santa Fe.

The four scientists will spend several weeks visiting the four regional laboratories of the Department of Agriculture, at Philadelphia, Peoria, New Orleans and Albany, Calif., where research concentrates on finding new uses for farm products. Then they will settle down to six months of intensive research at whatever laboratory and in whatever line of work each visitor may select.

This research visit was arranged with the Government of Argentina by the State Department, the Coordinator of Inter-American Affairs and the Department of Agriculture.

Science News Letter, August 15, 1942