METALLURGY

New Process Purifies Aluminum From Alunite

Years of Research and Experimentation Unlock Domestic Source in Huge Deposits in Southern Utah

A NEW domestic source of aluminum for the United States has been unlocked after years of research and experimentation.

Alunite, a white rock usually gray or pink tinted, has long been known as a combined sulfate of potash and alumina. Huge deposits in southern Utah, largest in the world, were worked during the first World War for potash.

When the United States became self-sufficient for potash from other domestic sources, scientists sought a practical process to obtain from alunite the material alumina, raw source of all metallic aluminum. The present source of alumina is bauxite, of which the United States has limited deposits in the South and is mainly dependent on high-grade imports from British and Dutch Guiana.

The U. S. Bureau of Mines recently estimated that there were 13,788,675 tons of pure alunite in Utah, Arizona, Colorado, California, Nevada and Washington, of which Utah has 11,680,000 tons.

Numerous patents have been issued on alunite processes, but all proved impractical in cost competition with bauxite until Kalunite, Inc., of Salt Lake City, after ten years of research and experiments in laboratory and pilot plant conducted by Dr. Arthur Fleischer, developed and patented the new process.

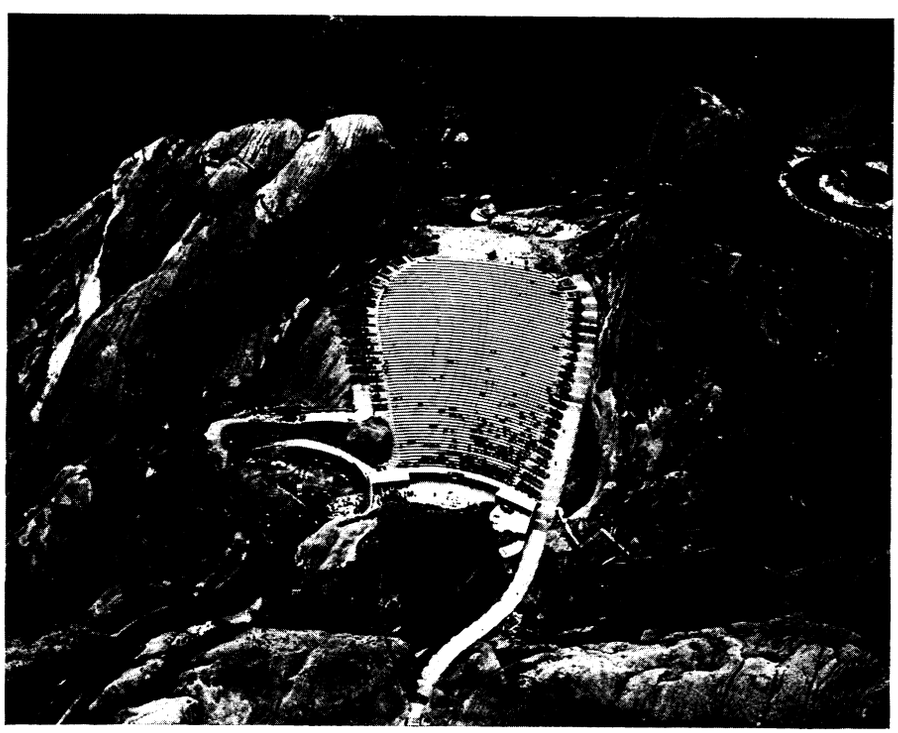
The Kalunite process produces alumina from alunite at a cost of $35 a ton, which means metallic aluminum at 11.865 cents a pound. This will permit it to compete in cost with Bayer alumina (the process used by the Aluminum Company of America).

Experts report that the metal produced from Kalunite alumina is equal in grade to that produced from Bayer alumina. There are available in the Marysvale region in Utah at least 3,800,000 tons of ore that can be treated by the Kalunite process for the cost reported. The amount of ore is sufficient to assure a life of at least 10 years for a plant producing 200 tons of alumina a day.

The Kalunite method produces alumina by the dilute sulfuric acid process and also produces as a by-product potassium sulfate. In brief, the Kalunite process starts with the long-known method of producing potassium alum and potassium sulfate from alunite. The potassium alum is utilized in order to take advantage of its property of separation by crystallization from solutions.

The alum is then put into an autoclave, which resembles an ordinary kitchen pressure cooker except that greater pressures are used. In the autoclave the normal potassium alum is changed to basic alum which is insoluble in water or dilute sulfuric acid. The alum is then calcined to separate the sulfuric acid from alumina resulting in the non-chemical mixture of alumina and potassium sulfate. The latter is removed by leaching.

Science News Letter, July 5, 1941



ROOMY

The size of the mountain theater is well indicated in this Lowry Field official aerial photo.

GEOLOGY—ENGINEERING

Great Amphitheater Carved Out of Mountain

CARVED by nature out of the mountains is Denver's new open-air amphitheater in the Park of the Red Rocks, 14 miles southwest of the city in the foothills of the Rocky Mountains. The park is formed of the gigantic, upthrust, ledges and crags of the old red sandstone, called Morrison sandstone locally, heaved up all along the eastern side of the Rockies by the gigantic forces that formed the mountains.

A slope, in a natural horseshoe between two of the great crags, Creation Rock and Ship Rock, descends to another crag that lay athwart its foot. The weathered convolutions of the latter, eroded and shaped like some gigantic marine shell, soften sound and send it swelling in golden notes up the slope, an effect that has long been noted.

At the base of this gigantic natural sound-board a giant stage has been built, about 175 by 75 feet, and up the slope have been constructed seats for 10,000 people—so wide apart that 20,000 can be seated by bringing in camp chairs between.

Original planner of the theater is George E. Cranmer, manager of parks and improvements in Denver. CCC