CHEMISTRY

Domestic Aluminum Source

Hope of continuous, production-line separation of aluminum from domestic clay seen in operation of experimental alumina plant by the Bureau of Mines.

➤ PROGRESS TOWARD securing a domestic source of aluminum metal is seen by officials of the U. S. Bureau of Mines as the result of eight weeks of operation of the experimental alumina plant at Laramie, Wyo.

Hope is for a continuous production line that will extract from common clay the equivalent of imported bauxite, the only practical aluminum ore.

Recovery of aluminum metal from clay is not the problem of working low-grade ore. There is plenty of aluminum everywhere underfoot. The difficulty of getting it out is the technical one of separating the aluminum from the silica with which it is combined.

Two main ways of making this separation have been explored in recent years, especially during World War II when enemy submarine activity made importation of bauxite hazardous. Either an acid or a combination of lime and soda can be used for chemical attack on the clay.

Although opposite in chemical properties, either process has for its goal separation of aluminum compounds from silica. The aluminum is wanted in a form that can be handled by present equipment designed for bauxite.

Clay is heated with lime and soda in the Laramie plant in such a way that the lime holds back most of the silica while the aluminum dissolves with the soda. After this separation, treatments with more lime, followed by carbon dioxide, remove more silica, and the remaining solution comes nearer to the quality of aluminum ore desired.

One trouble with any silica compound is the thick, gelatinous nature of the solution that may have to be dealt with. The Laramie plant meets this difficulty by putting in molasses which, surprisingly, delays the formation of the silica gel.

This step is considered a temporary stopgap by Bureau of Mines officials. Better ways of handling the clay compounds are expected to be worked out soon, as the new process becomes more streamlined.

Other processes worked on experimentally during World War II by both government and industrial laboratories used sulfuric or hydrochloric acids to extract aluminum from clay. Better separation from silica is accomplished by acid processes, but corrosion of vats, pumps and pipes that handle the acid solutions presents a more serious problem.

Clay treated by the lime-soda process as used at Laramie is more like the material now in common use in making aluminum metal from bauxite.

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PSYCHOLOGY

Disappears at Steady Stare

➤ MAYBE THE Cheshire Cat in Alice in Wonderland disappeared because Alice stared at it too steadily.

Try staring steadily at a single letter on this page. You may not realize it, but you can't hold your eyes completely still. You may do pretty well for the first second or two, but even then a tiny tremor keeps your eyes in constant, though small, motion. After the first second or two, your eyes start to drift away so that the image of the letter falls on different cells of your eye's retina.

It is this involuntary movement of the eye that enables you to keep on seeing the letter. If it were possible for you to keep your eyes completely still, the letter you are looking at would "wash out" and disappear like the Cheshire cat until even the grin (in this case, the white paper) is gone, too.

How objects disappear under a steady gaze was discovered in experiments at the Psychological Laboratory of Brown University, Providence, R. I. The results were reported to the *Journal of the Optical Society of America* (June) by Prof. Lorrin A. Riggs, Dr. Floyd Ratliff, Janet C. Cornsweet and Tom N. Cornsweet.

These investigators devised an ingenious method of keeping an image in exactly the same place on the eye's retina. A tiny mirror was mounted in a contact lens placed over the eye of the observer. Then rays from a projector were shone on the mirror, reflected on to a screen where it was seen by the observer. With every tiny movement of the eye, the mirror moved too. And so did the image on the screen.

At first the observers were surprised at how bright and steady the image looked. But soon it disappeared. A fine black line disappeared in the first few seconds. Heavier lines took longer to vanish and then would reappear from time to time for a minute in true Alice-in-Wonderland fashion.

For comparison the investigators allowed the image to shift with eye movements in the ordinary way. This was done by reflecting the image from the projector on a mirror mounted on a rigid support near the eye. They also doubled the ordinary amount of movement by the use of prisms.

With normal movement of the image on the retina, fine lines did fade, but they reappeared from time to time. Heavy lines remained steady.

With the movement of the image exaggerated by prisms, there was almost no disappearance of even the finest lines.

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