BOTTLE-FED

The pot contains only sand, completely without soil mineral nutrients. These are added in solution from the jar as it flows, drop by drop, from the tube.

METALLURGY

Produces Cheap Pig Iron From Poor Ores in New Way

A BRITISH iron maker has been successfully producing cheap pig iron suitable for producing steel from relatively poor ores for two years now by a new and basically different treatment of the ore in the blast furnace, Prof. Richard S. McCaffery of the University of Wisconsin told the American Iron and Steel Institute.

Forced to make use of British ores low in iron and high in undesirable alumina by the great demand for iron and steel brought about by Europe's armament race, the British firm has successfully applied an American suggestion. The process, Prof. McCaffery indicated, holds great promise of industrial use in this country and elsewhere where ironmakers are forced to turn to similar inferior ores.

Technicians handling the treatment of the low-grade ore used disregard its varying and undesirable sulfur content during the blast furnace operation itself, an "omission" never before made in commercial production of pig iron, the raw material from which steel is made. Instead they use a combination of chemicals to remove the sulfur in a separate step.

Forgetting about the sulfur content during the blast treatment, technicians operating the furnace are able to go ahead and produce the maximum amount of pig iron at minimum expense in the form of coke consumed and wasteful slag produced. This procedure is necessitated by the poor quality of the ore. If the usual method had been followed, it was indicated, production at a cost comparable to that of iron from higher grade ores would have been impossible.

The sulfur is removed by soda ash and fluorspar in a hot ladle into which the molten pig iron is poured. Many other technical advantages follow from the new procedure, Prof. McCaffery also pointed out. The British plant is at Corby, Northamptonshire, very close to the ore supply.

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ENGINEERING

Oil Refinery Piping Damaged By Salts Formed by Acids

By-Products of "Dosing"—50,000,000 Pounds of Them—Are Reported as Exacting a Tremendous Economic Toll

WIDESPREAD use of acids to boost production from oil wells has brought in its wake a major trouble for the petroleum industry in the form of thousands of miles of ruined pipelines and hundreds of ruined refinery units, petroleum engineers report.

Salts, 50,000,000 pounds of them, produced largely as by-products of the acid "dosing" of wells, are eating the walls of expensive pressure piping and plugging refinery tubes, exacting a stupendous economic toll, they reveal.

They are in addition lowering the value of residual oils and tars, eating up in waste a considerable portion of the increased income earned by the use of the acid process which increases the wells' yield.

Greater even than the cost of replacement parts and labor is the loss caused by equipment being out of service while repairs are made.

Petroleum engineers are turning increasing attention today, however, to this problem and report a number of desalting methods.

Can Be Reduced

Heat, pressure, and the addition of fresh water remove some of the salt from commercial crude oil, increasing the life of piping and refinery equipment greatly at a low cost. A Michigan installation, described (*Petroleum Technology,* May) by Dr. Gustav Egloff and a group of petroleum engineers of the Universal Oil Products Company, reduced the salt in incoming crudes from 220 to 5 pounds per thousand barrels.

Incoming oil was mixed with about 10 per cent. of water, then heated to 250 degrees under a pressure of 60 pounds. The salt removal, 212 pounds for each 1,000 barrels of oil handled, reduced corrosion from a continual cause of breakdowns to a very minor maintenance factor.

Chemicals to break up the shell of emulsion which protects brine globules from the surrounding oil have been used with some success. Once this protective coating is destroyed, water particles settle out of the mixture very rapidly, carrying the salt with them. Different chemcials are needed in each oil-producing area, and the search for a general desalting chemical agent, suited to all types and mixtures of oil coming to a refinery, is still going on.

Electrical Method

Electrical desalting, in one plant, decreased the salt content of the crude oil from 200 to 8 pounds per 1,000 barrels. This particularly corrosive crude oil, from an Arkansas field, was mixed with water, then subjected to an alternating potential of 16,000 to 32,000 volts. Before the desalting equipment, still tubes were completely blocked with deposits of solid salt after turns of only three to six days, and corroded excessively. After desalting, runs of 60 to 70 days without shutdowns were the regular thing, with less corrosion per run.

Whirling an oil-salty water mixture to remove the salt water offers considerable future promise, the engineers report. In test runs, centrifuges have removed all but a half pound of salt from oil originally containing 160 pounds per 1,000 barrels.

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