

CHEMISTRY

Protein Protects Metals

Chromated milk-protein films are used to coat such metals as zinc, iron, brass and aluminum to protect them from corrosion damage.

➤ A MIXTURE of casein from milk and a chromate is found to be an inexpensive, valuable protection for such metals as zinc, iron, brass and aluminum from damage in mildly corrosive atmospheres, the National Bureau of Standards reveals.

The process is simple. The metal to be coated is first dipped in a solution of casein, or of albumin or gelatin, allowed to dry, and then immersed in an acidified chromate solution. This contains weak chromic acid or a dichromate of zinc, iron or nickel. The protein coating becomes impregnated with the chromate, which both hardens it and delays corrosion.

During the war ordinary carbon steel became widely used as a substitute for scarce copper, brass, aluminum and stainless steel. While the steel was generally protected with zinc coatings, the tendency of the zinc to form objectionable corrosion products brought about a wide use of chromate films on the zinc. These films were found useful, but it was thought that an enhanced corrosion resistance would be obtained

by applying a larger quantity of chromate to the metal. The proteins were found to be a good medium for increasing the amount of chromate on the metal surface since they are basic and readily absorb or combine with chromic acid.

The development at the Bureau of Standards was carried out by staff members Abner Brenner, Grace Riddell and Robert Seegmiller. The chromated protein films are yellow and transparent. They do not crack or separate when the metal is bent. They are not injured by heating to approximately 300 degrees Fahrenheit, while most chromate films produced chemically on zinc lose much of their protective value at about the boiling point of water.

The protective value of these chromate-protein films is much superior to that of corrosion-inhibited oils and waxes, the Bureau states. They are almost insoluble in water, and are so hard that they can not be scratched with the finger nail. They can be quickly removed from metal parts by an alkaline solution such as 5% sodium hydroxide.

Science News Letter, April 17, 1948

GEOLOGY

No Antarctic Uranium

➤ ANTARCTICA is not likely to be the scene of a "uranium rush" or any other kind of international scramble for mineral wealth, at least in the immediate future. Comdr. Gerald L. Ketchum,

leader of the Navy's two-ship 1947-48 Antarctic expedition which has just returned after five months "down under," stated that "no minerals of any commercial value" had been found at any point

on the coast. And the expedition worked its way along the shores of the world's southernmost continent through more than half its perimeter.

More than two tons of mineral specimens were brought back by Dr. Earl T. Apfel of Syracuse University, geologist of the expedition, but they are "just rocks." They do have considerable scientific interest, for by analyzing them Dr. Apfel hopes to get some idea of the geologic age of the continent. In one area there were quantities of garnets, left by the disintegration of granitic rock; but these again are without commercial value.

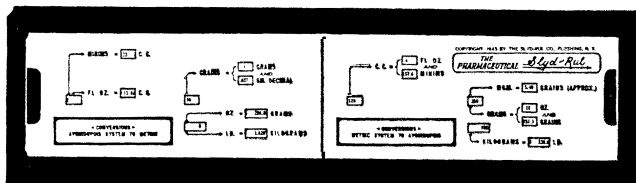
Disillusioning also was a visit to the Bunger Oasis, the ice-free area of land and lakes spotted from the air by a preceding expedition. It proved to be ice-free merely because the lie of the land caused the glaciers to part instead of flowing over it. The lakes, which were unfrozen when observed before, were frozen this time, and they were all salty, at that. No sign of life was found in the place, save one dead seal.

The expedition accomplished its primary mission, which was to make exact geodetic locations of certain landmarks, with which the air photographs taken on the preceding Navy expedition can be "tied in," thereby making more accurate charts possible. Comdr. Ketchum praised the performance of his two ships, the new ice-breakers *Burton Island* and *Edisto*. He also said that the expedition's helicopters performed well, within their limited range.

Weather was "nice," he added. Average temperatures were a little below freezing, and the lowest reading recorded was four degrees above zero Fahrenheit.

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