This Invention relates to the removing of incrustations from lead anodes used for chromium plating, and provides improvements therein.

Lead anodes (lead, but generally tin-lead, or antimony-lead) used in chromium plating solutions, in the course of operations, become heavily coated with lead oxides (mainly PbO₂) and also some lead chromate. When left standing in a solution containing chromic acid, the anode becomes coated with lead chromate. These coatings act to partially insulate the anode, the coatings becoming thicker and more insulating with time. The coating interferes with the normal distribution of the chromic acid deposited on the cathode, and especially in industrial chromium plating, where such coated anodes are used as conforming anodes, serious irregularities in current distribution and thickness of plate result.

Hereinafter, coated lead anodes have usually had the incrustations removed by wire brushing. This procedure is lengthy, the coating often incompletely removed, and, because of the dust produced, is uncomfortable and dangerous to the operator. Removal of the incrustations by dipping in a solution of hydrochloric acid has also been practiced, but is subject to the objection that it is difficult to avoid introducing chloride radicals into the chromium plating solution thereby upsetting the chromic acid-radical ratio of the plating baths.

The need for better ways of removing incrustations from lead anodes has long been recognized.

The present invention provides a method of removing incrustations from lead anodes, which is simple, safe, effective, quick, and without the disadvantages of previous methods.

According to the present method, coated lead anodes are electrolytically treated, as cathodes, in an electrolyte containing lead phosphate solution.

The solution used is one of potassium pyrophosphate dissolved in water, about fifty grams of the pyrophosphate per liter being used. A greater or less concentration may be used. Sodium pyrophosphate may also be used.

The temperature may be from room temperature to boiling.

The voltage used is approximately 6 volts, between the coated lead anode (connected as cathode) and the anode of the cleaning bath. From the standpoint of fast removal of the incrustations from the anodes, a current density of from 1 to 10 amperes per square inch is desirable. On the other hand, current densities as low as one-tenth ampere per square inch have been used.

The time of removal of the incrustation (cathodic action) varies with the thickness of the coating on the lead anodes being removed. Most anodes, including those heavily coated, can be satisfactorily cleaned in from 1 to 20 minutes.

When the current is first applied, slight gassing will soon occur at sharp points and at edges; as the time of treatment is extended the gassing will spread over all of the surface. When the gassing becomes uniform over the entire surface this is an indication that the electrolytic treatment is completed.

The lead anode which has been subjected to the cathodic treatment is then removed from the solution and wiped while wet to remove a film of loose, spongy material which is found on the lead anode after the cathodic treatment. Some of the lead is reduced from the coatings and remains on the anode as solid lead, and in recovering lead from the coatings, as lead solidly attached to the anodes, there is a saving of lead (about one-half), and this is an important advantage of the present process.

The expression, lead anodes, in the claim, includes anodes of lead and alloys of lead used for anodes, such as, for example, antimony-lead and tin-lead.

What is claimed is:

A method of removing incrustations from lead anodes used for chromium plating such incrustations being mixtures of lead oxides and lead chromate, comprising suspending the lead anode in an aqueous solution consisting essentially of an alkali-metal pyrophosphate, and passing current to the aforesaid lead article, connected in circuit in said solution as a cathode, and cathodically reducing the incrustated mixture of lead oxides and lead chromate to lead.

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REFERENCES CITED

The following references are of record in the file of this patent:

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