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ELECTRODEPOSITION OF CHROMIUM

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1 Claim. (Cl. 204—1)

It has been proposed to electroplate or deposit chromium from a solution of a chromic salt, but this has heretofore been impossible. If insoluble anodes are used, products are formed which destroy the deposit of chromium. If chromium anodes are used, the chromium dissolves as chromic acid and not as a chromic salt, so that deposition takes place from a chromic acid solution and not from a chromium salt solution.

An object of my present invention is to provide a process in which chromium dissolves at the anode as a chromium salt and not as chromic acid.

In my present invention the solution of chromium from a chromium anode as a chromium salt, and not as chromic acid, is achieved by adding to the electrolytic bath, comprising for example a chromium solution, substances which form special compounds with the chorimum and which do not, therefore, produce the well known ionic reactions of chromium. That is, they form compounds in which the chromium enters as a part of the complex ion and not as chromium ion or chromic acid ion.

Such substances that may be added are sulphites, thiocyanates or sulfocyanates and the like. Any suitable salt containing the desired anion, for example an alkali thiocyanate such as ammonium thiocyanate, potassium or sodium thiocyanate, or alkaline earth thiocyanates or thiocyanates of other metals can be employed. Other salts may be added to give special qualities of deposit and the electrolysis may be carried on in a slightly acid bath.

It will be understood that the chromium salt used in the chromium electroplating bath may be any suitable chromium salt as, for example, a chloride, sulphate, etc.

A preferred form of bath is as follows:

260 gr. of chromic chloride crystals
50 gr. of ammonium chloride
40 gr. of ammonium thiocyanate
10 to 20 gr. of boric acid
1 liter of water
Temperature of bath: 20° C.
Current density: 800 to 1000 amp./m²
Voltage: 4.6–5.8 volt

From this solution a lustrous chromium deposit is obtained. If the thiocyanate of ammonium content is increased, black, glossy, firmly adhering deposits are obtained.

What I claim is:

A process for the electrolytic deposition of chromium which comprises passing an electric current from a chromium anode to a cathode through an aqueous solution containing complex ions of chromium and thiocyanate radicals whereby chromium dissolves from said anode to form said complex ions and is deposited at said cathode.

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