

UNITED STATES PATENT OFFICE.

CARL LUCKOW, OF COLOGNE-DEUTZ, GERMANY.

PROCESS OF PRODUCING ACID CHROMATE OF LEAD.

SPECIFICATION forming part of Letters Patent No. 627,266, dated June 20, 1899.

Application filed December 31, 1897. Serial No. 665,212. (No specimens.)

To all whom it may concern:

Be it known that I, CARL LUCKOW, a subject of the King of Prussia, German Emperor, residing at Cologne-Deutz, Germany, have invented certain new and useful Improvements in Processes of Producing Acid Chromate of Lead by Means of Electrolysis, of which the following is a specification.

The invention has been patented in England, No. 14,801, dated August 6, 1895.

The object of this invention is to produce acid chromate of lead by means of electrolysis.

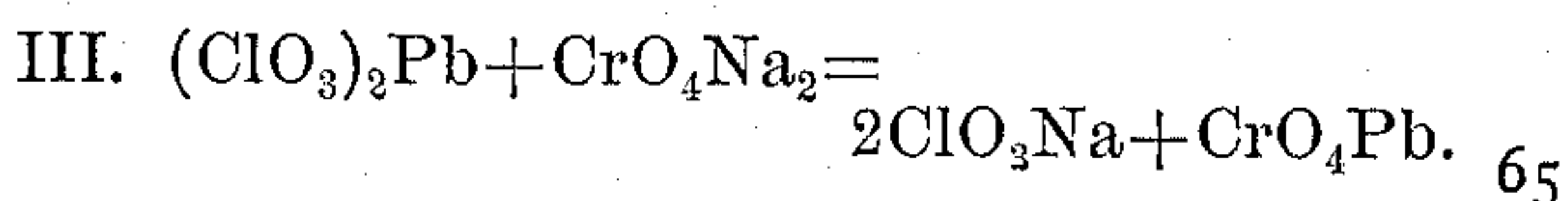
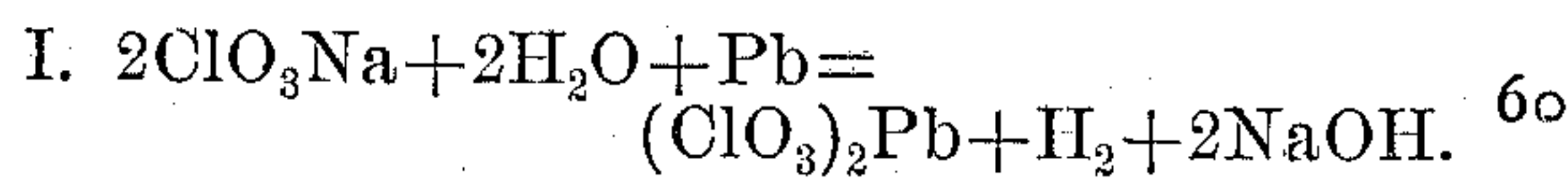
It consists, essentially, in the use of a salt of chloric acid with sodium, potassium, or ammonium in mixture with a salt of chromic acid with sodium, potassium, or ammonium in aqueous solution. The mixture should be about eighty per cent. of one of the salts named above of chloric acid and about twenty per cent. of one of the salts named above of chromic acid, and the aqueous solution should contain from 0.3 to three per cent. of the mixture, the quantities of salt always calculated free from water. This solution serves as electrolyte. The electrodes are of lead. Under the influence of the electric current the lead of the anode is dissolved by the chloric acid of the one salt, forming chlorate of lead, which dissolves and is directly precipitated by the chromic acid of the other salt as acid chromate of lead. At the same time water is decomposed, the oxygen of which enters into the chromate of lead, while the hydrogen escapes. The following chemical formulæ will explain the process somewhat further:

$$2\text{ClO}_3\text{Na} + \text{CrO}_4\text{Na}_2 + 4\text{H}_2\text{O} + \text{CrO}_4\text{H}_2$$
 Chlorate of sodium + chromate of sodium in aqueous solution acidified with chromic acid react under the influence of the electric current as if chloric acid + sodium hydroxid + chromic acid + sodium hydroxid + chromic acid were present. This chloric acid dissolves the

$$\text{Pb} = (\text{ClO}_3)_2\text{Pb} + \text{H.}$$
 lead anode, forming soluble chlorate of lead while hydrogen escapes. The chlorate of lead

$$\text{CrO}_4\text{H}_2 = \text{CrO}_4\text{Pb} + 2\text{ClO}_3\text{H.}$$
 is then precipitated by the chromic acid as chromate of lead and chloric acid regenerated.

The reactions go, therefore, on according to the chemical equations:



The chromic acid and the water thus consumed must be continuously added afresh to the electrolyte. By the use of such two salts in about such proportions and such weak aqueous solutions the acid chromate of lead formed does not adhere to the anodes, which keep bright. The process goes on continuously with the same electrolyte, as the chloric acid is not decomposed by the electric current and as the chromic acid and water consumed in the process are always added as they are consumed. The electrolyte being kept acid by a surplus of chromic acid, acid chromate of lead is obtained.

Example: A diluted solution one and one-half per cent. strong of a mixture of eighty parts, by weight, of chlorate of sodium with twenty parts, by weight, of chromate of sodium forms the electrolyte. The anode consists of soft lead and the cathode of hard lead, an alloy of lead and antimony containing five-tenths per cent. of the latter. The electrolyte is faintly acid. The tension of the current is 1.5 volts. The intensity of the same is fifty amperes. The density of the same is 0.5 amperes per square decimeter of anode-surface. The electrolyte has to be kept faintly acid during the electrolysis, and water and chromic acid have continuously to be added.

What I claim is—

The herein-described process of producing

acid chromate of lead by means of electrolysis
by using in connection with an anode of lead
an aqueous solution as electrolyte containing
from 0.3 to three per cent. of the sodium, po-
5 tassium or ammonium salts of chloric acid in
mixture with the sodium, potassium or am-
monium salts of chromic acid passing the cur-
rent and maintaining the bath constant by

the continuous addition of water and chromic
acid. 10

In witness whereof I have hereunto set my
hand in presence of two witnesses.

CARL LUCKOW.

Witnesses:

WILLIAM H. MADDEN,
OTTO STRECKER.