

ALIEN PROPERTY CUSTODIAN

PROCESS FOR THE IMPROVEMENT OF ELECTRICAL CONTACT CONDUCTIVITY IN APPARATUS FOR ELECTROLYSIS OF FUSED SALTS

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My invention relates to a process for the improvement of electrical contact conductivity at carbon or graphite electrodes, and more particularly, to the improvement of electrical contact conductivity in apparatus for electrolysis of fused salts.

It was observed that carbon electrodes, especially graphite electrodes, show the disadvantage that after good operating in the beginning the contact resistance at the current contacts to the electrodes increases considerably. These disadvantages may not even be avoided by making the contact areas at the current connections extraordinarily large. Now it was found that this very disadvantageous rise of resistance which causes not only substantial current leakage but also a strong stress of anodes and bus bars is due to the fact that the anodically evolved gases (formed gases), especially chlorine, diffuse through the pores of the electrodes and obstruct the current passage at the contact points between the current contacts and the electrodes. This observation is object of the new invention which relates to a measure which prevents or decreases the diffusion of the anodic gas, especially chlorine, to the current connections.

In carrying out my invention the carbon or graphite electrodes are impregnated with substances which are chemically resistant against the anodic gases as well as refractory. Moreover, these substances also secure a nearly gas tight protection of the electrodes. Thus it is possible, for instance, to impregnate the electrodes or at least the points of the electrodes between the electrolysis cell and the current con-

nection with chlorinated oils or chlorinated hydrocarbons. The electrodes may be subjected to a subsequent treatment with sulfuric acid. If preferred, similar advantages are obtained if the electrodes are impregnated with sugar syrup or other carbohydrate containing solutions such as cellulosic ethers, whereafter a treatment with sulfuric acid or other carbonizing substances such as phosphoric acid or zinc chloride may follow.

In accordance with my invention the electrodes may be washed with inert gases in the neighbourhood of the electrical contacts. Inert gases are, for instance, nitrogen, carbon dioxide, flue gases or the like. I prefer to rinse the graphite electrodes in such manner that a mixture with the gases of the electrolysis is prevented.

The above described effect was surprising for even if it was perceived that the increase of resistance was caused by the chlorine diffused to the current connections, it was not to be foreseen that this disadvantage could be eliminated by such simple methods as shown in this invention. In fact, these simple new methods secure a good current passage and, in consequence thereof a remarkable increase if the stability of the electrodes.

My invention may be utilized either with carbon or graphite electrodes, so-called Söderberg electrodes or the like, used either in apparatus for aqueous electrolysis or, more particularly, in apparatus for electrolysis of fused salts.

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