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PROCESS FOR ELECTROLYTICALLY PRODUCING ARSENATES

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1 Claim. (Cl. 204—86)

Of the arsenates used in practice, particularly in agriculture for the destruction of pests, fungi and the like, sodium arsenate alone can be made relatively economically by electrolysis. Lead arsenate has already been prepared electrolytically, but owing to the power consumption and apparatus difficulties the process does not come into consideration for technical use.

According to the processes known up to now sodium arsenate is formed by anodic oxidation of sodium arsenite, e. g. on anodes made of nickel sheet. After some time however a layer of solid arsenate forms on the anode which prevents the further electrolysis. It has already been proposed to overcome this difficulty by constructing the anode as a cylinder from which the salt is removed during continuous rotation. This means however that the carrying out of the electrolysis is rendered more difficult.

It has been found that the electrolysis can be so conducted in the following manner that this obstacle is removed in a technically simple and economical manner, the energy yield being still further improved.

Operations are carried out with diaphragms in the known manner. The catholyte consists of caustic soda solution, the anolyte consists of an aqueous mixture of arsenious acid and caustic soda or sodium nitrite. In contradistinction to the manner of working heretofore known the anolyte is maintained at an elevated temperature in the anode compartment, which temperature amounts to more than 40° C. The solution is continuously conducted in a circuit from the anode compartment into a vessel in which it cools down, when solid sodium arsenate crystallizes out, and is then led back into the anode compartment again. Care must here be taken that the concentrations in the anode compartment remain practically constant by continuous addition of the starting products.

It has been found for example that in the case of an anolyte temperature of 50–53° C., which has been maintained by heating, by circulation in the form described a well crystallized sodium arsenate was obtained on a suction filter which had been inserted into the circuit. The current yield was 98%. The tension amounted to 2.5 volts, whilst at ordinary temperature with the usual dimensions and proportions for the apparatus and of the electrolyte it was 3.5–3.2 volts. Decrease in the current yield very frequently takes place at raised temperature in anodic oxidation processes. The good yield obtained was not forthwith to be expected.

What I claim is:

The process for preparing sodium arsenate which comprises electrolyzing as the anolyte in the anode compartment of an electrolytic diaphragm cell an aqueous mixture of arsenious acid and caustic soda, or sodium arsenite, while providing caustic soda in the cathode compartment, maintaining the temperature of said anolyte within the range of from 40° C. to approximately 53° C. and a potential difference of about 2.5 volts, continuously withdrawing the anolyte liquor from the cell, cooling said liquor to thereby crystallize out the sodium arsenate, and returning the mother liquor to said anode compartment.

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