

ELECTROLYTIC PRODUCTION OF SELENIC ACID FROM LEAD SELENATE.

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Mentzer* has shown that the electrolysis of a solution of copper selenate results in the deposition of metallic copper upon the cathode and the formation of selenic acid in the solution. To obtain pure selenic acid the copper selenate must first be carefully purified by recrystallizing before electrolysis. In the experiments that are described in this paper, lead selenate was used as the salt to be electrolysed on account of the ease with which it could be prepared and purified.

Selenic acid was first prepared by oxidizing selenium dioxide in a nitric acid solution with potassium permanganate. After the precipitate of manganese dioxide had been removed by filtration, the selenic acid in the filtrate was precipitated as lead selenate by the addition of lead nitrate. Lead selenate is very insoluble in water and so can be filtered and easily washed free from the other salts in the solution.

For electrolysis, the lead selenate was placed in a platinum dish that was filled with water. The platinum dish was used as the cathode and a platinum wire coil was used as the anode. The resistance of the solution was very high at first, but it rapidly dropped as the electrolysis proceeded and the free selenic acid was formed.

To determine the amount of selenic acid that was formed during an experiment, the electrolyte was filtered and the acid in the filtrate was titrated with standard sodium hydroxide solution.

The current yield was best with low current density at the cathode, hot solution, and a large quantity of lead selenate upon the cathode, and decreased by the addition of powdered lead to the lead selenate. An increase in the volume of the solution or the use of a mercury cathode were without effect. The current yields were quite low—the maximum being about 12%.

*Mentzer, *Compt. Rend.*, 127, 54 (1898).

The per cent. yield of selenic acid from the lead selenate was best with room temperature, thin layers of lead selenate upon the cathode, and occasional stirring. 0.3 gm. of lead selenate when electrolysed with a current density of 0.3 amperes per sq. dec. gave a yield of 95.4% of the theoretical value. Under the same conditions 3 gms. of lead selenate gave a yield of 78.3%.

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