

**C46****Gas-evolving behaviour and cathode polarization in the fluorine electrochemical cell**

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In this report results are presented on studies of gas-evolving and cathode polarization in the fluorine electrochemical cell with an electrolyte composition  $\text{KF} \cdot 2\text{HF}$ .

It is known that the gas-evolving behaviour on the carbon anode of a fluorine cell is lyophobic, when fluorine slides on the anode surface, separating from it at the very top. Data on cathode gas-evolving behaviour are almost absent.

We established three types of fluorine cell cathode gas evolution:

- (1) random separation of hydrogen bubbles in the electrolyte mass
- (2) lyophobic behaviour of gas evolving when the gas slides upward without separating from cathode surface
- (3) evolution of the finest (invisible in size) bubbles in the form of dark flow closely adjoining the cathode surface.

The gas evolution type depends on the cathode material, current density and HF concentration in the electrolyte.

The cathode polarization rate increases through types 1 and 2 and reaches its maximum (up to 15 V) at type 3 gas evolution.

An attempt is made to explain the origin of each gas-evolving type.

Results obtained in these studies are used in a 20 kA nine 1000 mm carbon anode electrolytic cell in the Russian fluorine facility in Angarsk, whose fluorine yield in terms of current is near 100%.



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