

**Table 1.** Amount of electricity, %, spent on cathodic processes at potentials of 0.65 and -0.17 V, respectively.

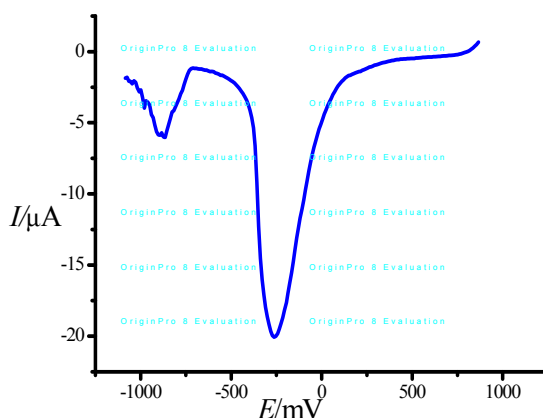
E (V)	Amount of electricity, %, (0 sec)	Amount of electricity, % (5 sec)	Amount of electricity, % (10 sec)	Amount of electricity, % (15 sec)
0.65	32.1±0.28	11.9 ±0.13	9.5±0.11	4.8±0.06
-0.17	67.9±0.70	88.1±0.91	91.5±0.94	95.2±0.97

As can be seen from figure 2 and table 1, over time of the amount of electricity spent on the reduction process, presumably intermediate hydrolysis products, quantitatively goes into the amount of electricity spent to dissolve thallium oxide, which gives the possibility of complete electrochemical dissolution of the oxide when potential equal to -0.17 V.

In order to prove the fact that thallium oxide dissolves with the formation of monovalent thallium,  $Tl_2O_3$  was precipitated in potentiostatic mode ( $E = 1.5V$ ) during the 5 minutes. Further, cathode polarization curves were registered to study the cathode peaks (Fig. 3). As can be seen from Fig. 3, two peaks are observed on the graph, indicating a two-stage dissolution mechanism of  $Tl_2O_3$ . At  $E = -0.25V$ , thallium(III) oxide is recovered in a monovalent state:



Further, at  $E = -0.86V$ , the recovery of the monovalent to metallic thallium takes place [15]:  $Tl^+ + e^- = Tl^0$

**Figure 3.** Cathode polarization curve on glass carbon electrode of deposited thallium oxide after precipitation during 5 minutes.