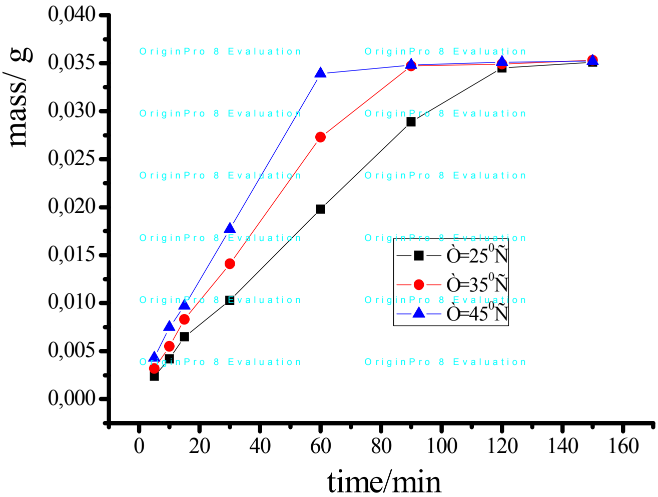

Figure 9. The deposited thallium oxide(III) mass dependence on time at different temperatures

To confirm this fact, the oxide of thallium(III) was deposited on the anode at different temperatures and at various times. The results are shown in Fig. 9. It can be observed that the increase of temperature contributes to achievement of a constant mass of oxide at lower electrolysis time. From the obtained data, values of the rate and activation energy of the electrodeposition processes of Tl_2O_3, were calculated.

CONCLUSIONS

Thereby, there has been established that intermediate products are formed when Tl_2O_3 precipitates, presumably: $TlOH^{2+}$, $Tl(OH)_2^+$. However, over time they transfer into Tl_2O_3, which should allow complete dissolution of obtained thallium oxide at potential values equal to -0.17 V. It has been established that the process of dissolution of thallium(III) oxide is a two-step process, the optimal background electrolyte is 1 mole/L Na_2SO_4, the optimum pH value is 11, ω = 500 rev/min and T = 60^0C. The results of the work indicate the possibility of selective precipitation of thallium via anode precipitation of Tl_2O_3. The obtaining thallium can be used for further purification, in particular by zone melting. It is known that the purer the metal enters for refining by the zone melting method, the higher the degree of its purity. High-purity rare metals, in particular thallium, are used in semiconductor technology.