ELECTROSYNTHESIS OF PEROXIDE COMPOUNDS ON THE BASIS OF MONOBASIC AND DIBASIC CARBOXYLIC ACIDS AND THEIR SALTS

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It is known, that the synthesis reaction of Kolbe with the formation of dimeric products occurs with the electrolysis of carboxylic acids and their salts on the anode from platinum and other anode-stable materials:

\[ 2 \text{RC}^\ominus + 2 \bar{e} \rightarrow 2 \text{RC}^\ominus \rightarrow \text{RR} + 2 \text{CO}_2 \]

For example, under certain conditions of electrolysis, a temperature decrease causes insignificant formation of peroxide type compounds according to the reaction of dimerization of carboxylic radicals:

\[ 2 \text{RC}^\ominus \rightarrow \text{RC}^\ominus \rightarrow \text{RC}^\ominus \]

We have shown, that Kolbe reaction may be completely displaced to the side of the formation of peroxide compounds. It is reached by the introduction of the additives of alkali metal or ammonium radonids, inhabiting the reaction of oxygen evolution into the solution of the initial electrolyte.

Thus, the possibility of the synthesis of performic, peracetic, peroxalic acids and their salts is shown. It is determined by means of volt-ampere-metric method that the potential of the reaction of oxygen evolution strongly displaces to the anodic region of oxidizing the carboxylate-ions in the presence of additives in the aqueous solutions of organic acids and their salts. Therefore the formation of peroxide compounds goes with the participation of water molecules according to the following diagram:

\[ \text{RC}^\ominus - \bar{e} \rightarrow \text{RC}^\ominus ; \text{H}_2\text{O} - \bar{e} \rightarrow \text{OH}^- + \text{H}^+ \]

\[ \text{RC}^\ominus + \text{OH}^- \rightarrow \text{RC}^\ominus \]

The synthesized organic peroxide compounds were identified by removing the IR-spectrum on the spectrometer "Infralyum 801" with Fourier transformation. The patent on the method of the synthesis of peracetic acid (№2216537, Russia) is also obtained.