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ANALYSIS METHODS FOR PYRAZINE-2,3-DICARBOXYLIC ACID SYNTHESIZED USING ELECTROCHEMICALLY REGENERATED $KMnO_4$

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Abstract

Previous studies have shown that pyrazine-2,3-dicarboxylic acid (PDCA) can be obtained through quinoxaline (Q) oxidation with electrochemically regenerated $KMnO_4$ using Pt, Ni, stainless steel, Cu, brass and bronze electrodes. This corresponds to a smaller oxidant consumption as compared to the chemical oxidation reaction, a smaller energy consumption, an increase in the PDCA manufacturing efficiency and a significantly smaller impact on the environment due to secondary products removal (both from Q oxidation as well as from $KMnO_4$ production).
This paper presents the analysis methods used for the quantitative determination of PDCA obtained through Q oxidation (such as conductometric titration, UV-VIS and IR spectrophotometry) as well as those used for monitoring Mn^{7+} and Mn^{6+} concentrations (UV-VIS spectrophotometry and the visual method). The right conditions for applying these methods were established in order to properly evaluate the electrochemical process.

Key words: conductometric titration, IR spectrophotometry, pyrazine-2,3-dicarboxylic acid, UV-VIS spectrophotometry

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