

**OXIDATION OF *N*-ACETYLCYSTEINE BY DIPEROXYAZELAIC ACID : KINETIC STUDY AND IDENTIFICATION OF PRODUCT. A KINETIC SPECTROPHOTO-METRIC METHOD FOR THE DETERMINATION OF *N*-ACETYLCYSTEINE**

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*N*-acetylcysteine (RSH) as an antioxidant in vivo and in vitro has been widely used. For example, it decreases the toxicity of diquat to hepatocytes, protects animals against paracetamol hepatotoxicity, and it serves as the antidote of choice for paracetamol overdose in humans. It has received attention as an antioxidant for components of cigarette smoke and for treatment of various respiratory diseases. Recently, there has been several reports suggesting that RSH is cardioprotective against ischemia/reperfusion injury and finally several authors have proposed RSH as a therapeutic agent in AIDS. The oxidation kinetics of *N*-acetylcysteine by diperoxyazelaic acid (DPAzA) has been studied by differential spectrophotometric method at 1.1 (0,1 mol L<sup>-1</sup> HCl) and 4.7 (0,2 mol L<sup>-1</sup> KH<sub>2</sub>PO<sub>4</sub>) pH at different concentration ratio  $R=[RSH]_0/[DPAzA]_0$  from 0.71 to 4.29 ( $5 \cdot 10^{-4}$  mol L<sup>-1</sup> ≤ [RSH]<sub>0</sub> ≤ 1·10<sup>-3</sup> mol L<sup>-1</sup>, ( $5 \cdot 10^{-4}$  mol L<sup>-1</sup> ≤ [DPAzA]<sub>0</sub> ≤ 1·10<sup>-3</sup> mol L<sup>-1</sup>) (Fig. 1 and 2). In all the cases studied *N*-acetylcysteine (RSSR) is the only first oxidized product formed (Fig. 1, λ=246-248 nm).

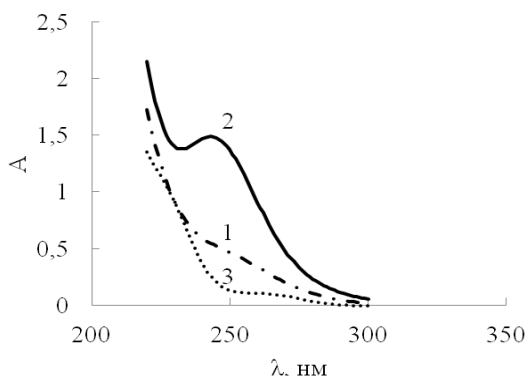


Fig. 1. Differential absorption spectra of the reaction mixture of *N*-acetylcysteine and diperoxyazelaic acid (36 h after the start of the reaction),  $R=[RSH]_0/[DPAzA]_0$ : 1 – 2; 2 – 1. [RSH]<sub>0</sub> = 1·10<sup>-3</sup> mol L<sup>-1</sup>; HCl 1·10<sup>-1</sup> mol L<sup>-1</sup> (pH=1.1) and 3 – only RSH.

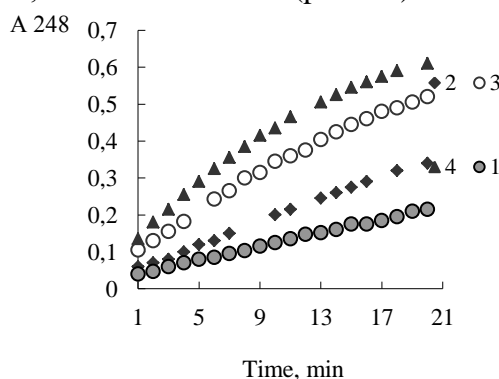


Fig. 2. Kinetic evolution of RSSR as a function of time. [RSH]<sub>0</sub>/[DPAzA]<sub>0</sub>: 1 – 0.71; 2 – 1.43; 3 – 2.86; 4 – 4.29. [DPAzA]<sub>0</sub> = 7·10<sup>-4</sup> mol L<sup>-1</sup>; HCl 1·10<sup>-1</sup> mol L<sup>-1</sup> (pH=1.1).

A new kinetic spectrophotometric method for the determination of *N*-acetylcysteine has been presented. The calibration of graphic for kinetic determination of *N*-acetylcysteine ( $0,5-5 \cdot 10^{-3}$  mol L<sup>-1</sup>) by the reaction with DPAzA:  $tga=10,1c+0,005$  ( $r=0,995$ );  $c(DPAzA)=7 \cdot 10^{-4}$  mol L<sup>-1</sup>; HCl 1·10<sup>-1</sup> mol L<sup>-1</sup> (pH=1.1).