

Investigation of the effect of prolonged exposure to OCA-aerosol (glycerin/propylene glycol) on rat plasma by Raman spectroscopy.

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An urgent problem of our time is the replacement of tobacco smoking with the use of devices with steam smoking mixtures. However, scientists have already proved that their use also has a negative effect on the human body causing irreversible changes [1]. Raman spectroscopy (RAMAN) is one of the methods that allows analyzing the molecular composition of a substance, in particular blood and its components [2]. When inhaling "smoking mixtures", many chemical compounds enter the bloodstream, including glycerin and propylene glycol [1,3]. When smoking, from 3 to 10% of active substances accumulate in the blood, which have a negative effect on the body. Since one of the functions of blood is transportation, it is it that carries chemical compounds harmful to the body, therefore, the object of research in this work is plasma, which makes up most of the volume of blood.

The purpose of this work is to evaluate the possibility of measuring the minimum concentration of OCA (glycerin and propylene glycol) in blood plasma by Raman spectroscopy, as well as to study the RAMAN spectra of rat blood plasma after prolonged exposure to OCA aerosol. The OCA - aerosol was a solution of glycerin and propylene glycol. Previously, an experiment was conducted during which laboratory rats were exposed to the inhalation effect of an OPA aerosol. 5 inhalations were carried out per day for an average of 5-7 minutes with breaks of 15 minutes. The animals were removed from the experiment on day 28.

Based on the results obtained, it is safe to say that the experiment on long-term exposure to OCA - aerosol confirmed the results obtained during the experiment to assess the possibility of measuring the minimum concentration of OCA. The minimum limit concentration for each of the solutions was equal to: 5% for glycerin solution, 3% for blood plasma with the presence of glycerin, 2% for propylene glycol solution, 10% for blood plasma with the presence of propylene glycol. The results for the experiment on the study of long-term exposure to OCA - aerosol showed that during the entire time the position of the center does not change in the bands of rams equal to: 422.85; 1010.85 and 1342.91 cm^{-1} . There was a sharp drop in the number of peaks after 14 days, after which, after 28 days, the number of peaks increases again almost to the initial state. At the end of the experiment, the intensity at the CR shift, which corresponds to glycerin [4], increased by 14.74%, while the position of the center of this peak shifted. During this experiment, no shifts were observed that would be characteristic of propylene glycol. The obtained data can be used for further research.

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