

Analysis of gas composition of a cold plasma jet generated on the basis of atmospheric pressure microwave discharge

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Using chromatography, the analysis of the gas composition in a cold plasma jet, which is a streaming afterglow of a microwave glow discharge at atmospheric pressure, was carried out. The plasma jet was formed by interaction of discharge plasma with atmospheric air behind the outlet of the 6-electrode plasma torch, electrical power to which was supplied from the waveguide microwave (2.45 GHz) plasmatron. An analysis of the gas samples of the jet showed that when plasma-forming argon flows through the microwave discharge, hydrogen and methane are formed behind the discharge region, and the concentration of carbon monoxide increases by 5–6 times. The study of reactive oxygen species in the cold plasma jet was carried out using liquid chromatography of an aqueous solution of isopropyl alcohol after treatment with the plasma jet. It was found that because of plasma treatment, partial oxidation of isopropyl alcohol to acetone occurred. This allows us to consider acetone as an indicator of reactive oxygen species (hydroxyl radicals, atomic oxygen and ozone) in a cold plasma jet.

Keywords: microwave discharge, microwave plasmatron, cold plasma jet, chromatography.

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