DIRECT PIEZO-DISCHARGE AS A SOURCE OF NITROGEN OXIDES AND NITRous ACID [[1]](#footnote-1)\*)

DOI: 10.34854/ICPAF.2022.49.1.160

Artem’ev K.V., Davydov A.M., Kolik L.V.

Prokhorov General Physics Institute of the Russian Academy of Sciences

A low-temperature plasma source based on a piezoelectric transformer is described in [1, 2]. In this work, we studied the air composition during its treatment with a direct (without a dielectric barrier) piezo-discharge. Qualitative and quantitative analysis of air composition during treatment was carried out on an Infraspec FSM 2202 FTIR spectrometer. Air treatment was carried out in a closed cylindrical chamber, which was located in the cuvette section of the FTIR spectrometer along the diagnosing IR beam. In this case, the IR spectra of the treated air medium were recorded directly during the operation of the piezo-discharge. The IR spectra contained absorption bands of nitrogen oxides NO, NO2, N2O and nitrous acid HONO. The absorption bands of other possible compounds did not exceed the noise level. The quantitative calculation of the average concentration of nitrogen oxides in the discharge chamber was carried out using the HITRAN open database. Quantitative calculation of the average concentration of nitrous acid HONO was carried out according to the data presented in [3].

References

1. E.M. Konchekov, N.G. Gusein-zade, L.V. Kolik, K.V. Artem’ev, A.V. Pulish. Using of direct piezo-discharge in generation of plasma activated liquid media // IOP Conf. Series: Materials Science and Engineering 848 (2020) 012037.
2. E.M. Konchekov, A.P. Glinushkin, V.P. Kalinitchenko, K.V. Artem’ev, D.E. Burmistrov, V.A. Kozlov and L.V. Kolik. Properties and use of water activated by plasma of piezoelectric direct discharge // Front. Phys., January 2021, Volume 8, Article 616385.
3. William S. Barney, Lisa M. Wingen, Matthew J. Lakin, Theo Brauers, Jochen Stutz, and Barbara J. Finlayson-Pitts. Infrared absorption cross-section measurements for nitrous acid (HONO) at room temperature // J. Phys. Chem. A 2000, 104, 1692-1699.

1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/XLIX/Pt/ru/HA-Artem'ev.docx) [↑](#footnote-ref-1)