Abstract Submitted
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Breakdown in vapors of alcohols: methanol and ethanol[1] ZORAN LJ. PETROVIC, JELENA SIVOS, NIKOLA SKORO, DRAGANA MARIC, GORDANA MALOVIC, Institute of Physics, University of Belgrade — Breakdown data for vapors of the two simplest alcohols – methanol and ethanol – are presented. The breakdown is achieved between plan-parallel electrodes, where cathode is made of copper and anode is a thin film of platinum deposited on quartz window. Diameter of electrodes is 5.4 cm and electrode gap 1.1 cm. We compare breakdown voltages (Paschen curves) for methyl and ethyl alcohol in the pressure range 0.1 - 2 Torr. In both vapors, the pressure is kept well below the vapor pressure, to prevent formation of liquid droplets. For each point of Paschen curves corresponding axial profiles of emission are recorded by ICCD camera in visual part of the spectra. Axial intensity distributions reveal important processes of excitation. Both vapors show strong emission peak near the cathode at all pd values covered by measurements, which indicates that excitation by ions and fast neutrals play important role in the discharge. Preliminary spectrally resolved measurements of the discharge structure with optical filters show that dominantly emission comes from CH band at 431 nm. There is a very low intensity of Hα emission detected in ethanol vapor at high E/N, while it is much stronger in methanol even at lower E/N. It is interesting to note that Hα emission in methanol exhibits exponential increase of intensity from the cathode to the anode, so it comes mainly from excitation by electrons, not heavy particles.

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