

## Ion formation in methane/air flames – effects of species diffusion

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### Abstract

The ionic composition of methane-flame plasma was already widely investigated – see e.g. [1, 2]. The calculated and experimental ionic mass-spectra agree quite well [2]. However, the ion density spatial profiles show large difference in the spatial width of distribution – see Fig. 1. It was proposed that the main cause of the difference is related to light species (like hydrogen, CH or OH) diffusion. The distribution of these species significantly influence primary  $\text{CHO}^+$  ion distribution, through the well known Calcote mechanism of ion formation. The paper presents progress in the investigations.

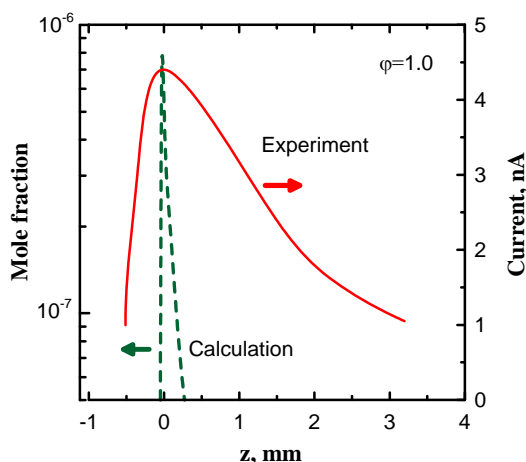


Figure 1. The spatial profiles of calculated ion density (dashed) and measured current (solid)

### References

- [1] Egsgaard H and Carlsen L. (1993). Mechanistic aspects of ionic reactions in flames. *J. Anal. and Appl. Pyrolyses* 25: 361.
- [2] Rodrigues JM, Agneray A, Jaffrézic X, Bellenoue M, Labuda S, Leys C, Chernukho AP, Migoun AN, Cenian A, Starik AM, Titova NS, Savel'ev AM. (2007). Evolution of charged species in propane/air flames - mass-spectrometric analysis and modelling. *Plasma Sourc. Sci. Technol.* 16: 161.