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Hydrogen halides at Comet 67P/Churyumov-Gerasimenko: a whole mission overview

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In Dhooghe et al. (2017) and De Keyser et al. (2017) we have studied the halogen-bearing compounds in the coma of 67P/C-G with Rosetta-ROSINA/DFMS (Rosetta Orbiter Spectrometer for Ion and Neutral Analysis/Double Focusing Mass Spectrometer) from first encounter up to perihelion (August 2014-August 2015) and concluded the main halogen-bearing compounds in the comet atmosphere were the hydrogen halides HF (hydrogen fluoride), HCl (hydrogen chloride) and HBr (hydrogen bromide). An increase in the halogen-to-oxygen ratio as a function of distance was observed which suggests a distributed source for HF and HCl, probably through progressive release of these compounds from grains.

We present an update of the results. First, there have been important updates on the calibration parameters for DFMS as well as updates on how these parameters changed over the course of the mission. Second, we now report on all HF and HCl data collected during the mission covering the period from the 7th of August 2014 up to the 6th of September 2016, thus greatly expanding the hydrogen halides database. We discuss our new results in view of the expanded database and the updated DFMS calibration parameters.

Dhooghe, F. et al.: Halogens as tracers of protosolar nebula material in comet 67P/Churyumov-Gerasimenko, MNRAS, 472, Issue 2, 1336, doi 10.1093/mnras/stx1911, 2017.
De Keyser, J. et al.: Evidence for distributed gas sources of hydrogen halides in the coma of comet 67P/Churyumov–Gerasimenko, MNRAS, 469, Issue Suppl_2, S695, doi 10.1093/mnras/stx2725, 2017.