

On the origin and evolution of the volatile material in comet 67P/Churyumov-Gerasimenko

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Comets belong to the most pristine objects in the solar system and their composition provides important clues to the physical and chemical processes occurring before, during, and after formation of its nucleus. During 2 years of close observation the Rosetta Orbiter Spectrometer for Ion and Neutral Analysis (ROSINA) measured the gases in the coma of comet 67P/Churyumov-Gerasimenko (67P/C-G). These volatiles originate from the evaporation of the ices contained in the nucleus.

In this presentation we will discuss the elemental, molecular, and isotopic abundances of the volatiles measured by ROSINA and compare the obtained results to various objects in the solar system, numerical modeling and observations of interstellar material around protostars, and laboratory reference measurements. Based on these findings we will attempt to trace the history of the ices in comet 67P/C-G.