Abstract

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Anaïs Bardyn, Donia Baklouti, Hervé Cottin, Nicolas Fray, Christelle Briois, John Paquette, Oliver Stenzel, Cécile Engrand, Henning Fischer, Klaus Hornung, Robin Isnard, Yves Langevin, Harry Lehto, Léna Le Roy, Nicolas Ligier, Sihane Merouane, Paola Modica, François-Régis Orthous-Daunay, Jouni Rynö, Rita Schulz, Johan Silén, Laurent Thirkell, Kurt Varmuza, Boris Zaprudin, Jochen Kissel, Martin Hilchenbach:

Carbon-rich dust in comet 67P/Churyumov-Gerasimenko measured by COSIMA/Rosetta.

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Cometary ices are rich in CO_2, CO and organic volatile compounds, but the carbon content of cometary dust was only measured for the Oort Cloud comet 1P/Halley, during its flyby in 1986.

The COmetary Secondary Ion Mass Analyzer (COSIMA)/*Rosetta* mass spectrometer analysed dust particles with sizes ranging from 50 to 1000 μm, collected over 2 yr, from 67P/Churyumov-Gerasimenko (67P), a Jupiter family comet.

Here, we report 67P dust composition focusing on the elements C and O. It has a high carbon content (atomic C/Si = 5.5 +1.4, −1.2 on average) close to the solar value and comparable to the 1P/Halley data.

From COSIMA measurements, we conclude that 67P particles are made of nearly 50 per cent organic matter in mass, mixed with mineral phases that are mostly anhydrous. The whole composition, rich in carbon and non-hydrated minerals, points to a primitive matter that likely preserved its initial characteristics since the comet accretion in the outer regions of the protoplanetary disc.