

# Alkali metals and other light elements in the dust of comet 67P/Churyumov-Gerasimenko

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## Abstract

During the ESA Rosetta mission to 67P/Churyumov-Gerasimenko (67P hereafter), the COSIMA instrument onboard the space craft collected about 35,000 particles in the inner coma between August 2014 and September 2016 [1–3]. The time-of-flight secondary ion mass spectrometer (ToF-SIMS) subcomponent of COSIMA was used to analyze many of these particles. It was found among other results that the dust contains high levels of Na and to a lesser degree K when compared to chondrites and solar system abundances [4,5].

Since Na shows a higher overabundance than K, we look into possible differences of chemical context in which the alkali metals and other rock forming elements are present in the cometary particles. Figure 1 shows an example for Na distribution at particle Jean-Baptiste on the COSIMA dust collection target 2CF. Figure 2 shows the same particle but the K distribution. The maxima of both distributions are in different places. The ion image for Al in Fig. 3 is noisier than for the alkali metals but tentatively shows its higher values where the K is also high.

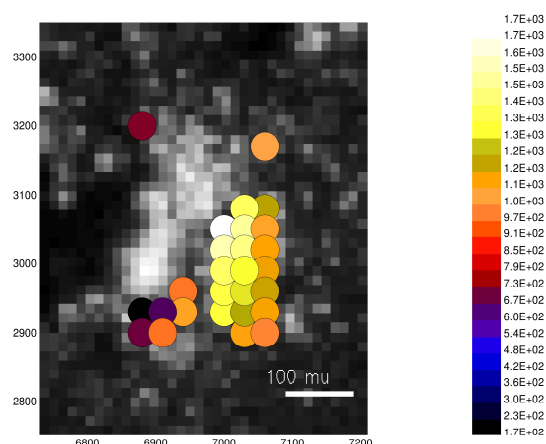


Figure 1: Integrated and normalized Na peaks from COSIMA ToF-SIMS spectra at various positions on the particle Jean-Baptiste on target 2CF.

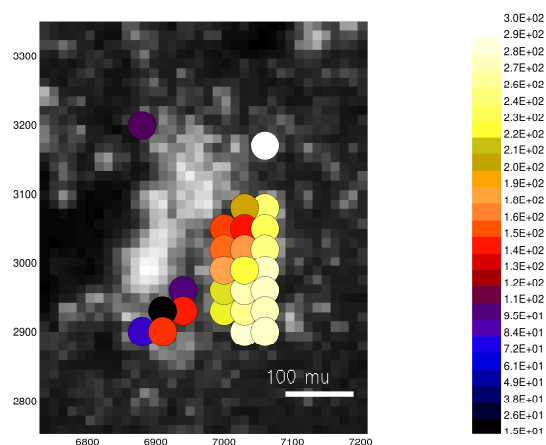


Figure 2: Integrated and normalized K peaks from COSIMA ToF-SIMS spectra at various positions on the particle Jean-Baptiste on target 2CF.

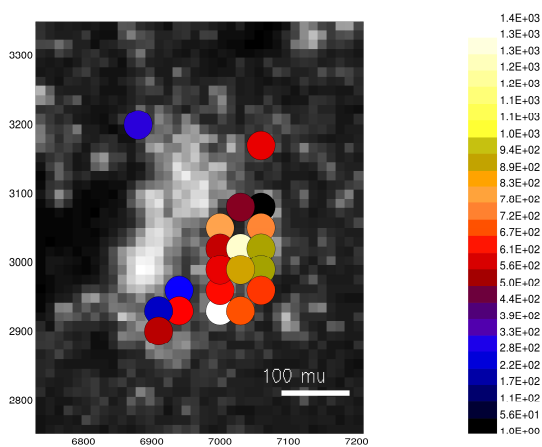


Figure 3: Integrated and normalized Al peaks from COSIMA ToF-SIMS spectra at various positions on the particle Jean-Baptiste on target 2CF.

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