

Laboratory Studies of Cometary Analogs with ROSETTA-COSIMA. M. Hilchenbach¹, H. Krüger¹, Ch. Briois², J. Kissel¹, Y. Langevin³, J. Silen⁴, H. Cottin⁵, C. Engrand⁶, H.J. Lehto⁷, K. Lehto⁸, R. Schulz⁹

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Abstract: Following the encounter of the Rosetta Mission with its target comet 67P/Churyumov-Gerasimenko in 2014 and 2015, cometary dust grains ejected off the comet nucleus surface will be collected and analyzed with the secondary ion mass spectrometer instrument COSIMA onboard ROSETTA. The collecting metal targets will be imaged, grains identified and selected cometary dust grains will be exposed to the high energy primary ion beam and the sputtered secondary ions will be analyzed with the high resolution ion mass spectrometer [1].

The identification and classification of organic and inorganic compounds expected to be present in cometary grains are carried out currently with the COSIMA instrument reference model. Analog materials consist of mineral grains in the size range of 1 μm to 100 μm . Organic compounds are applied directly to the sample target or silica grains, coated with organics, are analyzed. The individual analog samples reflect only in part the envisaged properties of the cometary grains while the overall grain statistics should give a good indication of the measurements to be expected with the real cometary grains. The analog systems include iron minerals such as olivine, pyroxene, hematite or pyrrhotite and simple and complex organic compounds as deduced from past cometary in-situ, remote and sample return observations [2-5].

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