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**Analysing a STARDUST analogue sample mixture by closed-system step etching – a major step towards measuring all cometary noble gases.**

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Comets formed in the cold, outer reaches of the Solar System. They might carry primordial noble gases trapped during comet formation that possibly contributed to Earth's atmosphere. First cometary samples were returned from comet 81P/Wild 2 by the Stardust mission. A characterization of *all* their noble gases could, however, not be achieved so far [e.g. 1, 2].

We aim to apply the closed-system step etching (CSSE) technique developed at ETH Zürich to study all cometary noble gases in a Stardust particle track. The CSSE line allows sequential gas release at a comparatively low blank level.

Here, we present results of a successful etch experiment on a Stardust analogue mixture, containing aerogel, lunar meteorite PCA 02007 and organic matter (OM) from the CV3 chondrite Vigarano. We successfully separated the components released from aerogel and lunar silicates using HF at variously harsh etching conditions. While air from aerogel was released in the first steps, solar wind from the meteorite was mainly released later. Furthermore, HNO<sub>3</sub>-induced extraction of the OM will be discussed at the meeting.

[1] Marty B. et al. (2008) *Sci.* 319: 75-78.

[2] Palma et al. (2013) LPSC 44<sup>th</sup>, #1694.

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