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Background and Artifacts Generated by the by the Sample Preparation Experiment on SAM

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Sample Analysis at Mars (SAM) is one of the instruments of the Mars Science Laboratory mission. Three analytical devices composed the SAM experiment: the Tunable Laser Spectrometer (TLS), the Gas Chromatography (GC) and the Mass Spectrometer (MS). To adapt the nature of a sample to the analytical devices used, a sample preparation and gas processing system implemented with (a) a pyrolysis system, (b) wet chemistry: MTBSTFA and TMAH (c) the hydrocarbon trap (silica beads, Tenax® TA and Carbosieve G) and the injection trap (Tenax® GR composed of Tenax® TA and 30% of graphite) are employed to concentrate volatiles released from the sample prior to GC-MS analysis.
Our study investigates several propositions for chlorinated hydrocarbon formation detected in the SAM background by looking for: (a) all products coming from the interaction of Tenax® and perchlorates present on Mars, (b) also between some soil sample and perchlorates and (c) sources of chlorinated hydrocarbon precursors. Here we report on the detection of chlorohydrocarbon compounds and their potential origin.