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### **Timing of aqueous alteration in CM chondrites**

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Many carbonaceous chondrites have undergone reactions with H<sub>2</sub>O during their formation history. The exact timing of this hydration, which led to the formation of phyllosilicates, carbonates, PCP phases, and other minerals, is still debated, as well as the location and mechanism of the reactions. In order to constrain these, the different hydrous mineral assemblages in the CM chondrite Maribo [1] have been documented by SEM. Maribo shows complex disequilibrium parageneses, e.g., unaltered metal grains next to completely hydrated chondrules which implies that either the alteration was extremely heterogeneous on a  $\mu\text{m}$ -scale or that the constituents have undergone the hydration prior to final accretion.

Lamellae for TEM studies of a fishbone-like tochilinite phase from Maribo and of a compact PCP object from the CM chondrite Murchison have been separated by applying the focused ion beam (FIB) technique. Further studies on hydrated minerals of the CM chondrite Sutter's Mill [2] and on the cosmic symplectites (COS) in Acfer 094 are in progress.

[1] Haack, H. et al. (2012), MAPS 47, 30-50. [2] Yin, Q.-

+ Z. et al. (2012) MAPS 47, #5276.

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