**Supporting Information**

Biomarker records and mineral compositions of the Messinian K–Mg salts from Sicily

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Fig. S1. The µ-XRF intensity maps of O, S, Na, Cl, Mg, Al, P, and Si, together with the picture of the measured area in K-1. Color scales indicate element concentrations in signal counts per second. Black crosses in the µ-XRF intensity map of S denote µ-XANES measurement points.



Fig. S2. The µ-XRF intensity maps of O, S, Na, Cl, Mg, Al, P, and Si, together with the picture of the measured area in K-3. Color scales indicate element concentrations in signal counts per second. Black crosses in the µ-XRF intensity map of S denote µ-XANES measurement points.



Fig. S3. The XRD spectra of spot 2-1, 2-2, and 2-3, together with the reference spectra of halite, kainite, and leonite. The presence of kainite peaks in spot 2-1 is probably due to contamination of kainite during the sampling by dental drill, because halites only occur as small crystals, making the sampling procedure difficult.



Fig. S4. (a) Thin section of K-2 under transmitted light. Area filled with resin is indicated as R. (b) Close-up of the red rectangle showing fluid inclusion bands in a halite crystal.