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## Assessing the potential of <sup>230</sup>Th/U dating of gypsum and other evaporites

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Evaporites such as sulfate, halite and nitrate salts accumulate in (hyper-)arid regions such as the Atacama Desert. In widespread areas, gypsum (or anhydrite) is the predominant sediment component mostly present in the form of dust, crusts or concretions. Selenite crystals are preserved in former lake environments. The chemical and isotopic composition of evaporites yield the potential to reconstruct their source, their formation mechanisms and also climate conditions at the time of deposition. Therefore, constraints on the chronology of these deposits are of wide interest.

The  $^{230}$ Th/U dating method bears the potential to determine the absolute ages of different materials up to ca. 600 thousand years. In theory, uranium is incorporated into the evaporite, while thorium is fractionated due to its more particle-reactive behaviour. Therefore, the age of evaporites can be determined by quantifying the radioactive decay of the incorporated U to  $^{230}$ Th.

Here we present new method developments as well as the first results of  $^{230}$ Th/U dating of gypsum and other evaporite samples from the Atacama Desert, Chile. Special care has to be taken during sample preparation of gypsum samples in order to minimize detrital contamination while ensuring sample-spike equilibration for both uranium and thorium. Different approaches for sample digestion have been tested for optimal results and are presented here together with first U and Th concentration data and ( $^{230}$ Th/ $^{238}$ U) and ( $^{234}$ U/ $^{238}$ U) activity ratios.