

Dynamics of salt crystallization over evaporating porous surfaces

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Evaporation of saline water from porous media plays a significant role in various environmental, engineering, and hydrological processes ranging from soil salinization and crop production to ecosystem functioning and preservation of building and pavement materials. During evaporation process, the advective capillary flows transport the solute from the wet zone within the porous medium to the vaporization plane at the surface where gradual increase of salt concentration results in salt crystallization and deposition over the surface.

In this project, we aim to investigate the impact of soil texture and ambient condition on the dynamics of salt crystallization over evaporating porous media. Well-controlled laboratory experiments will enable us to address the impact of a wide range of parameters on the crystallization process and understand how the presence of evolving crystallized salt may alter evaporation rates from porous media.

If you are interested in this project, please contact Dr. Milad Aminzadeh (milad.aminzadeh@tuhh.de) for further details.

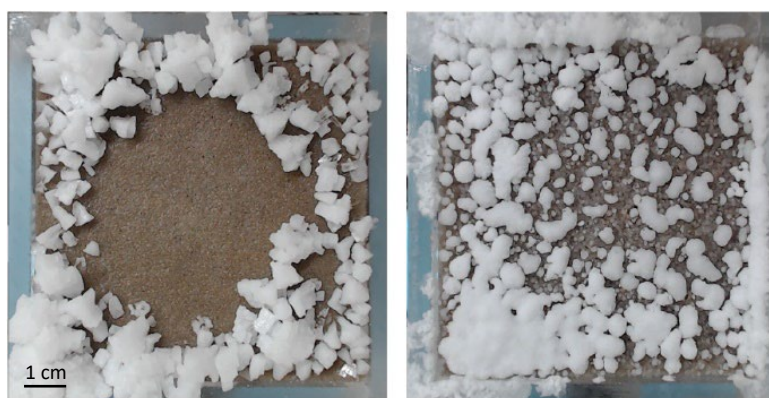


Figure 1: Formation of NaCl crystals over evaporating sand samples: left) fine sand with particle size ranging from 0.1 to 0.4 mm, right) coarse sand with particles of 0.7 to 1.2 mm. The samples were subjected to similar environmental conditions ($u=1$ m/s; $T_a=21^\circ\text{C}$, $RH=40\%$)

References

Norouzi Rad, M., and N. Shokri (2014), Effects of grain angularity on NaCl precipitation in porous media during evaporation, *Water Resour. Res.*, 50, 9020–9030. <https://doi.org/10.1002/2014WR016125>

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