2021 EGU General Assembly, SSS12.3: Microaggregates in soil: Exploring formation pathways, turnover, properties and function in-situ, in-vitro, and in-silico

Analysis of porosity and pore connectivity of soil microaggregates by intrusion of the molten alloy `Wood´s metal´

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Research question:

• Is the interior of soil microaggregates (SMA) a domain, where the exchange with the surrounding solution is limited by the narrowing and tortuosity of pores?

Hypothesis:

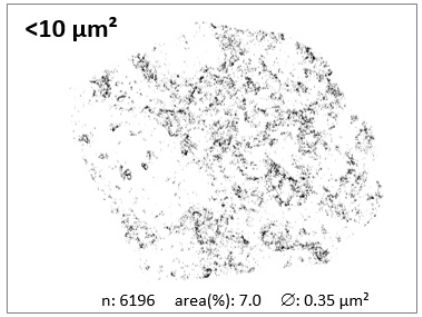
• Analysis of pore space characteristics in SMA by visualization and quantification of connected “open” as well as closed pore structures in each three different pore size classes (<10, 10-100 and >100 µm²) will reveal accessibility of pore spaces in the interior of SMA.

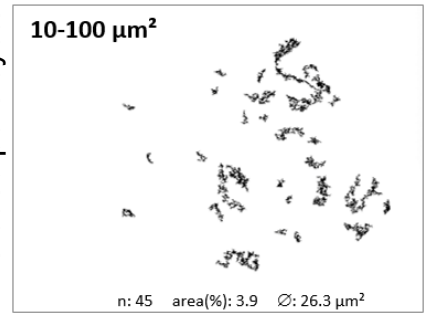
Results:

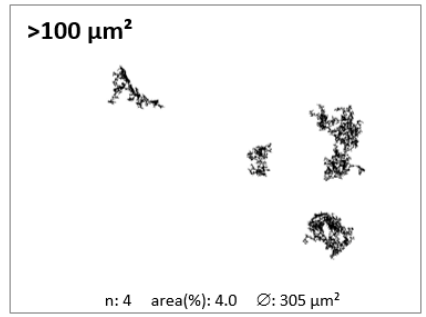
• SMA exhibit in addition to extended connective pore systems also sections with high shares of clay minerals, where the pore size distribution is narrow.

• The share of closed pores <20nm in ∅ not accessible by the molten alloy ranged from 20 to 40% of total porosity. Here element transport and habitation by microorganisms might be restricted, supporting increased C preservation.

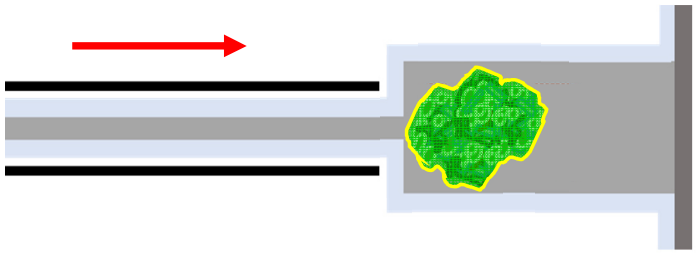
Closed pore systems







Scheme of cell for intrusion



Polished section

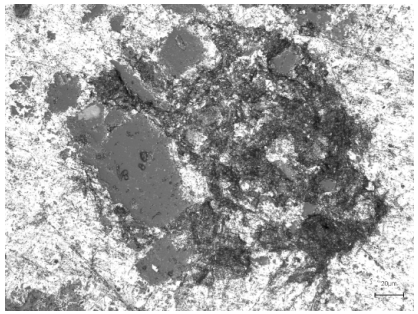


Image analysis

