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Preliminary Studies on Potential Rock Samples for CCS in the Pannonian Basin, Hungary

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SUMMARY

One of the largest storage potential for CCS is in the deep saline aquifers because their pore water cannot be used for drinking and for agricultural activities. In the Pannonian Basin (Hungary) there are a few sedimentary subbasins filled up by sedimentary rock sequences containing such aquifers, which have the main potential for CCS. Our chosen study area in the Pannonian Basin is the Jászság subbasin, where numerous seismic data and documents of hydrocarbon exploration wells are available. As Hungary is situated in the middle of the Pannonian Basin, its emissions could be significantly reduced by CCS. That is the main reason to find a suitable place for CCS.

The potential reservoir rock series now form a hidrogeologically coherent regional system, indicating a large potential for storage capacity. Furthermore, the saline aquifer system is large enough to ensure its long-term industrial usage for CCS, because the injection does not cause critical increase in the pressure. The siltstone in the selected formations does not have porosity high enough to be the storage rock, whereas the permeability is not low enough to be a good cap rock. That is why we avoided sampling siltstone-rich rocks. Our detailed studies deal with the sandy Szolnok Formation, and the clayey Algyő Formation. The Szolnok Formation is consists basically of sandstone, its bottom is nearly 1000 to 3500 m deep under the surface, thus it would be used as a storage rock. Its cap rock is called as Algyő Formation with more than 1000 m thickness, and a clayey composition.

These potential rock associations are studied in detail in our ongoing research. We will do ex situ tests observing the behavior of the rocks when injecting supercritical CO2 in the saline pore water on pressure and temperature representing the depth of planned injection conditions. These results will be presented in our poster. Tests are made on both of the storage, and reservoir rocks. Moreover, we will present some tests with samples from the boundary of cap and reservoir formations to determine what kind of geochemical reactions and petrophysical changes take place on the very critical part of the storage complex, in order to ensure long term safe storage.