A combined approach to monitor gas mixtures, containing CO_2, in geological system :aquifers

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One major concern of the geological storage of CO_2 is the leakage and diffusion of CO_2 into the adjacent aquifers. This requires regular monitoring of the aquifers and field sampling tests from these geological systems. One known inconvenience of the conventional industrial sampling equipment is the degassing of the sample during the transfer and analysis from aquifer.

In this work a state-of-the-art apparatus capable of taking samples at reservoir conditions *i.e.* the depth of 3500 meters and temperatures up to 400 K is presented. The monitoring apparatus offers a combined chain of 1) in depth measurements and sampling, 2) single phase sample transfer to the surface 3) dissolved gas composition measurements and 4) thermodynamic prediction of the composition of the dissolved gas in the aqueous phase. One of the major advantages of the presented measuring tool in comparison to the existing industrial tools is the capability of keeping, transferring and analysing the sample in reservoir conditions.

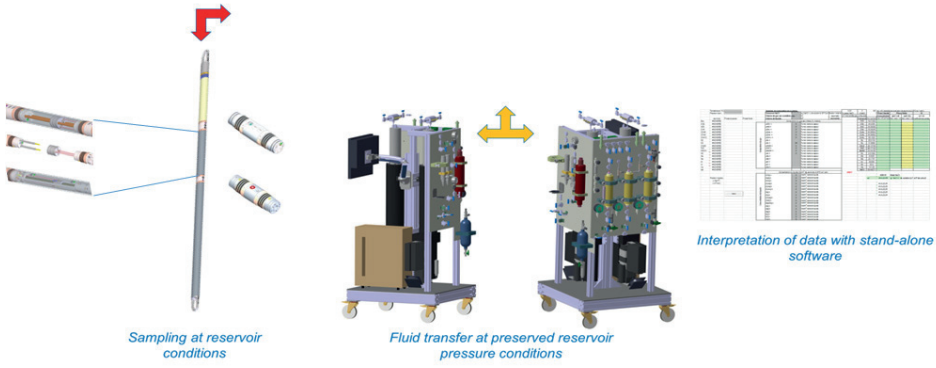

Figure 4 - Schematic of the combined measurement tool for monitoring dissolved gas in aquifers