

Supplementary Material

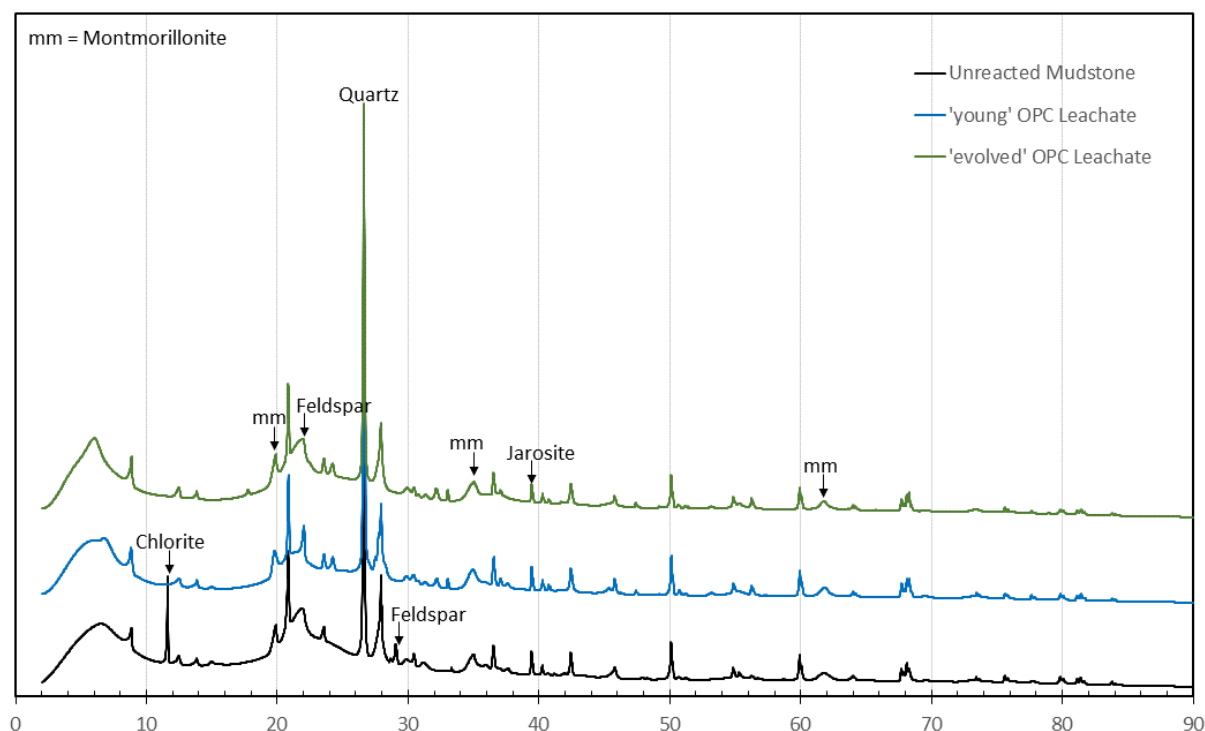


Figure S1. XRD analysis of unreacted and reacted mudstone samples from 10:1 F:S batch experiments with OPC leachates. Showing little difference between unreacted and reacted solids.

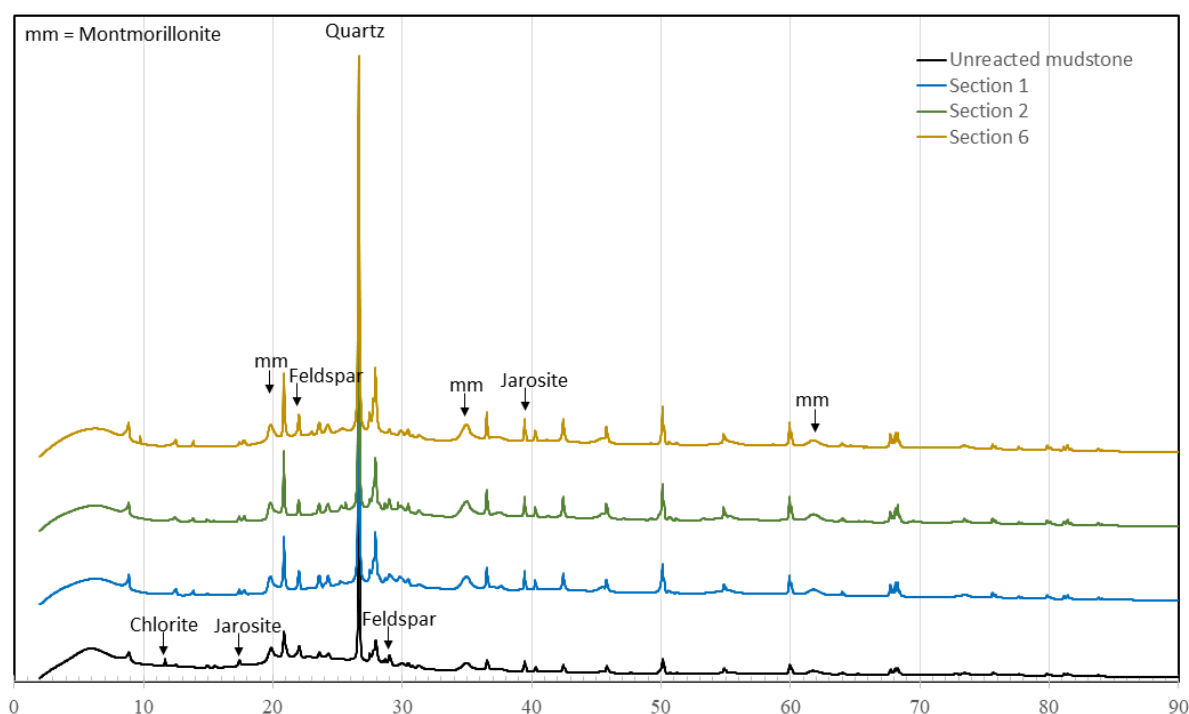
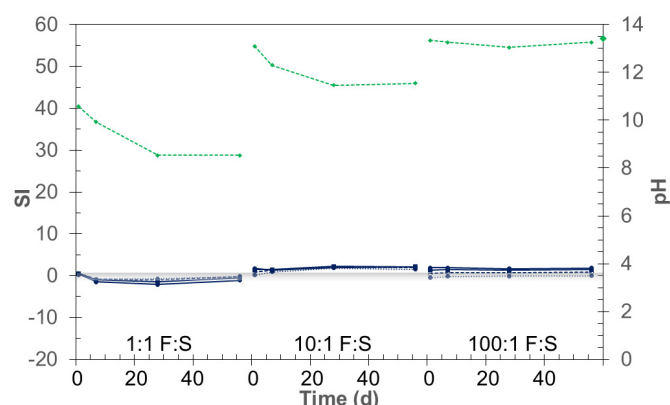
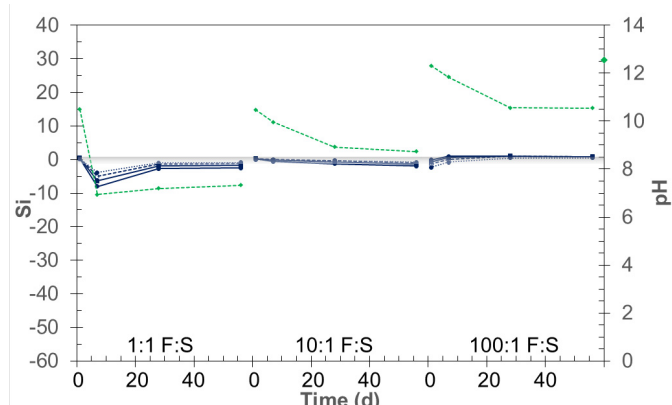


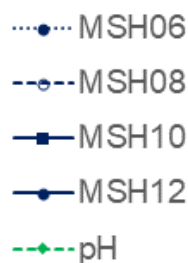
Figure S2. XRD analysis of unreacted and reacted mudstone samples from SFC flow experiment with the 'young' OPC leachate, Sections 1, 2 and 6. Showing little difference between unreacted and reacted solids.



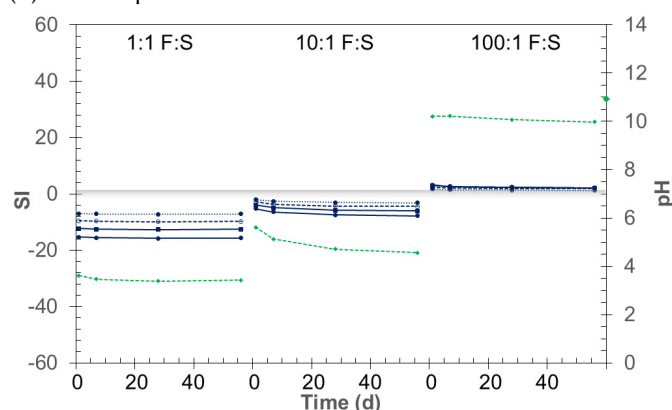
(a) Batch experiments with 'young' OPC leachate



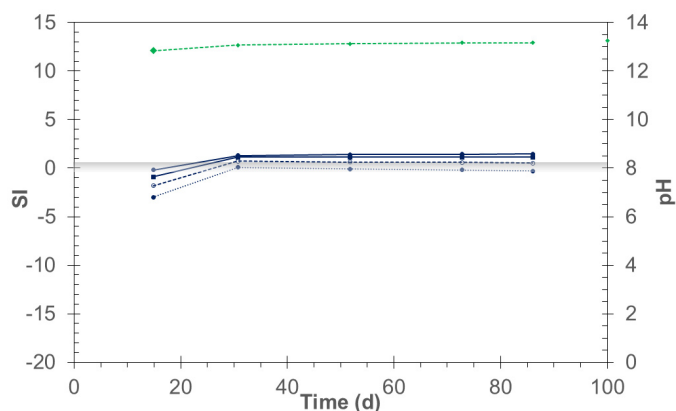
(b) Batch experiments with 'evolved' OPC leachate



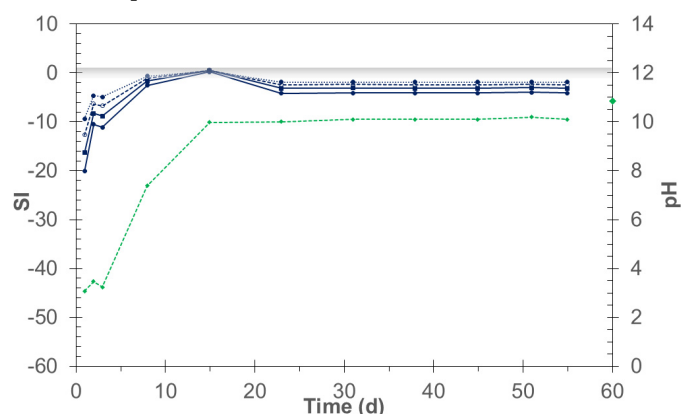
Legend for all SI plots



(c) Batch experiments with HFSC424 leachate



(d) Column experiment with 'young' OPC leachate.



(e) Column experiment with HFSC424 leachate.

Figure S3. Indicative M–S–H saturation indices (SI) with time, together with pH. Batch experiments are plotted from low to high F:S ratio for comparison with the flow experiments (M–S–H in blue, pH in green). Shaded grey line indicates equilibrium state i.e. $SI = 0$, below this line minerals will tend to dissolve, and above it may precipitate. Note vertical axis are to same scale as Figure 7, which shows C–S–H and zeolite SI.