Black shale and graphite surface area changes due to fungal activity - an interferometric study

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Abstract
The oxidative weathering of black shale organic matter (OM) plays an important role in diverse processes like atmospheric CO_2 control and acid mine drainage. Fischer & Gaupp (2005) quantified the reactive portions of the black shale surface area during weathering. Here we want to test the influence of microorganisms on the degradation of black shale OM. In this study black shale as multi-component rock material and graphite as pure carbon source were used for incubation experiments with lignolytic fungi. *Schizophyllum commune*, a wood-rotting fungus, is able to excrete enzymes which are able to degrade (lignin like) carbon structures in organic rich rock materials. Amongst others, Fritsche et al (1999) and Wengel et al (2006) demonstrated the degradation of organic carbon due to fungal activity. Our investigations by vertical scanning interferometry microscopy quantified the rate of black shale OM and graphite degradation by white-rot fungus *Schizophyllum commune*. Due to microbial colonization the reacted rock surfaces got typical etch pits. The etch pits, with an average depth of 120-150nm, occur more frequently and with more continuous elongate morphology on the graphite surface.

References

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