



## **Subsurface Biodegradation in a Fractured Basement Reservoir, Shropshire, UK**

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Subsurface biodegradation in current oil reservoirs is well established, but there are few examples of fossil subsurface degradation. Biomarker compositions of viscous and solid oil residues ('bitumen') in fractured Precambrian and other basement rocks below the Carboniferous cover in Shropshire, UK, show that they are variably biodegraded. High levels of 25-norhopanes imply that degradation occurred in the subsurface. Lower levels of 25-norhopanes occur in active seepages. Liquid oil trapped in fluid inclusions in mineral veins in the fractured basement confirm that the oil was emplaced fresh before subsurface degradation. A Triassic age for the veins implies a 200 million year history of hydrocarbon migration in the basement rocks. The data record microbial colonization of a fractured basement reservoir, and add to evidence in modern basement aquifers for microbial activity in deep fracture systems. Buried basement highs may be especially favourable to colonization, through channelling fluid flow to shallow depths and relatively low temperatures