

Exploring the potential of Banded Iron Formations for geologic H₂ generation

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It is now well established that geologic H₂ is emitted from a variety of intracontinental settings, through potentially different generation processes, such as radiolysis, organic matter cracking and iron oxidation. As exploration for this new resource is starting on every continent, focus is placed on mafic and ultramafic intrusions for their high iron (II) content and potential to generate H₂ through serpentinization. This reaction has already been well documented on the North-American Mid-Continent Rift, composed of a multi-kilometric scale accumulation of mafic rocks, particularly on the southernmost part of the rift in Kansas, because of occurrences of H₂ emissions in old wells. The northernmost part of the rift, however, remains to be explored, particularly in the Lake Superior region. Though mafic and ultramafic rocks are also present, little attention is being given to Banded Iron Formation (BIF), despite their iron(II)-rich mineralogy. This presentation will examine the H₂ generating potential of these formations, by reviewing the mineralogy of various BIFs around the planet, and specifically comparing Australian BIFs in the Pilbara region, around which H₂ emissions have been suspected, and the formations found in the Lake Superior region. The uncertainties about the existence of economical reservoirs and efficient cap rocks in those environments will also be discussed.