

HYDROTHERMAL BRECCIAS FROM LUCKY STRIKE AND MENEZ GWEN (MID ATLANTIC RIDGE): MINERALOGY, GEOCHEMISTRY AND GENESIS

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The Lucky Strike and Menez Gwen hydrothermal fields are located in the Mid-Atlantic Ridge, at 37°20'N and 37°50'N, respectively. The first one was discovered in 1993 and the other in 1994. Hydrothermal breccias were discovered and sampled in both hydrothermal fields. These rocks, usually called slab, form plates around the active or inactive hydrothermal edifices, and are composed of basaltic fragments (generally vesicular glass, rarely crystallised) and in minor amounts chimney fragments, cemented by hydrothermal precipitates (amorphous silica in several forms, barite, sulphides, Fe and Mn oxides and hydroxides, and clay minerals). The pieces of basalt glass are part of hyaloclastites deriving from the surrounding volcanoes, and may exhibit different stages of alteration. This is clearly seen in petrographic observations. In some samples the fragments are almost replaced by other products. This is considered an initial stage of low temperature hydrothermal alteration. X-ray diffraction indicates so far, a minor clay component (smectite group), and amorphous material, composed essentially of Si, Al and Ti, according to microprobe analyses. Silica is the principal component both in the altered basaltic fragments and in the matrix. Mass balance calculations in the basaltic elements of the slab, indicates an effective gain in silica, not usual in hydrothermally altered oceanic basalts. Values of REE and Sr isotopes ratios indicates a mixed origin (sea water plus hydrothermal fluid) for the fluid that is responsible for the slab formation and the consequent alteration of the basaltic fragments.