



The Lake Bosumtwi Impact Crater Drilling Project, Ghana: Target rocks, geochemistry, shock metamorphism

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Lake Bosumtwi, Ghana, was drilled in 2004 within the frame of ICDP. This excellently preserved 1.07 Ma impact structure is the source of the Ivory Coast tektite strewn field and the associated microtektites. Processes, and specific precursor rocks that caused formation of these glassy lithologies, however, are not yet constrained in detail.

The core BCDP-8A, drilled in the central uplift of the crater, contains only two principal target lithologies - carbonaceous greywackes with CaO and MgO contents of up to 8.5 wt.%, and a variety of light grey to dark grey, mostly finely laminated, and in part graphitic shales to slates. These rocks amount to about 80 vol.% of the totally recovered material, 20 vol.% are breccias. The greywackes and shales form graded sedimentary sequences; their pre-impact regional-metamorphic overprint is low and corresponds to the upper greenschist facies. The present day $^{87}\text{Sr}/^{86}\text{Sr}$ isotope ratios of these different lithologies range from 0.707409 to 0.726376. The absence of diaplectic quartz crystals in rocks of core BCDP-8A indicates a maximum shock pressure of less than 26 GPa in the uplift. This is much less than in the central uplift of other impact structures. Outside the morphologic rim of the Bosumtwi crater in the north, greywackes and shales to slates occur, and in addition, higher-metamorphic rocks, namely two-mica schists and a staurolite-rich-mica-schist with Al_2O_3 of up to 22.3 wt.%. There fragments of very fresh impact glass are also present. The ultimate reason for this too low shock pressure in the central uplift is yet unconstrained, and may be related to specific impact conditions.