

GEOLOGICAL AND GEOCHEMICAL FINGERPRINTS IN REVEALING THE STRATIGRAPHIC SEQUENCE OF THE TECTONICALLY JUMBLED OPHIOLITE MÉLANGE ZONE IN MANIPUR, NORTH-EAST INDIA AND THEIR IMPLICATIONS ON THE ANCIENT OCEANIC BASIN

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Abstract

The Ophiolite Belt in Manipur consists predominantly of tectonic slices representing various units of an ancient oceanic floor that include the ultramafic body, mafic dykes and sills, pillow lavas, pelagic sediments, etc. in a jumbled manner. There are also a number of exotic blocks of various rock types hosted by ultramafics and pelagic shales. The assembly of different tectonic slices and exotic blocks of the whole range of litho-units of the floor rocks of an ancient oceanic basin constitute the Manipur Ophiolite Mélange Zone (MOMZ). All the litho-units are tectonically jumbled and no two consecutive litho-units are preserved intact in the field. Careful geological mapping and analysis of the disposition of these litho-units coupled with the mode of association of the intrusives and extrusives with the then ocean floor sediments as observed in the present field setting provide important clues for deciphering the correct sequence of the litho-units of the ophiolite belt. Petrological and geochemical fingerprints of the ophiolitic rocks and the exotic mélange sandstone also provide information not only about type of the ophiolite but also about the palaeo-environment prevalent in the ancient oceanic basin and which have been used as tools for establishing the correct order of the stratigraphic sequence. The pillow lavas have an average vesicle diameter of about 0.3mm and specific gravity of about 2.89. A relation of vesicle size and specific gravity with the depth of water during the lava extrusion in form of a graph is established from which the depth of the ancient basin of the MOMZ has been postulated to range between 2000-2600m. Based on information decrypted from the facts found concealed in various manifestations of the tectonically jumbled litho-units, a simplified and generalised stratigraphic sequence of the MOMZ is worked out.

Keywords: Ophiolite; Tectonic slices; Petrological; Geochemical; Stratigraphic sequence, Manipur.