

## Depositional Environments of Hydrogenetic Ferromanganese Crusts in the NW Pacific Oceans

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We report the preliminary results of the two cruises of ROV (HyperDolphin 3K, operated by JAMSTEC) mapping of sea floor occurrence and in-situ sampling of hydrogenetic ferromanganese deposits. This is the first systematic joint scientific research on the crusts over the deep-sea floors, which unveiled the ubiquitous distribution of the crusts covering the rock substrates. The results of physical measurements of morphology and thickness of the crusts, geochemical characterization of very surface portions of intact samples, distribution patterns of occurrences and thickness. The successful operation and ongoing shorebased geochemical and geological analyses proved that the ROV is one of the best methods in careful mapping, sampling and in-situ observation of sea bottom.

Keywords: ferromanganese crust, manganese nodule, ferromanganese nodule, cobalt-rich, seamount, minor elements