

## Mineral diversities of hydrogenetic ferromanganese crusts and nodules in the Northwestern Pacific sea floors.

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We, together with Kochi University, JAMSTEC, Geological Study of Japan, and JOGMEC, have been studying the parameters controlling the compositional and geological diversities of metal-rich hydrogenetic ferromanganese crusts and nodules in the Northwestern Pacific seafloors. Our results suggest ubiquitous distribution on outcropped rocks of the seamounts or deep sea basins of no or low sedimentation. The on-site observation and shore-based analyses of the deposits indicated abundant and common occurrences of hydrogenetic Fe-Mn oxide precipitates at a wide range of water depths between 1 - 6 km in the oceans. Our geological and geochemical studies also suggest that the deposits have been formed continuously since the Middle Miocene or older, building 10-cm thick piles of precipitates. We will also report the results of on-site exposure experiments and geochemical analyses.

Keywords: crust, marine mineral resource, hydrogenetic, manganese deposit, manganese nodule, northwestern Pacific