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マンガン瘤の研究 V. 鉄マンガン相の熱変態について*

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Study on the Manganese Nodule V. Thermal Studies of the Iron-Manganese Phase

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Abstract: The thermal phase transformation of the iron-manganese phase of the Pacific Ocean manganese nodules were studied by the differential thermal and X-ray diffraction methods. X-ray powder patterns of the heated samples at the temperature of 600°C to 1000°C show the occurrence of hematite, bixbyite and cubic and tetragonal $(Fe, Mn)_3O_4$. Bixbyite produced by the heat treatment of the iron-manganese phase gives an abnormal X-ray pattern in comparison with the standard sample of bixbyite. Cubic $(Fe, Mn)_3O_4$ is produced not only by the reaction of bixbyite with hematite over 900°C, but also at the lower temperature, such as 600°C. While, tetragonal $(Fe, Mn)_3O_4$ is a reaction product of cubic $(Fe, Mn)_3O_4$ with bixbyite over 900°C in the case of manganese rich nodules. The species and quantities of the products after the heat treatment are assumed to be mostly influenced by the relative contents of iron and manganese in the manganese nodule.

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