

Progress of serpentinization reactions and successive changes of mineralogical textures in Iwanai-dake ultramafic body

Akane Miyoshi¹, Tetsu Kogiso^{1*}

¹Graduate School of Human and Environmental Studies, Kyoto University

We investigated successive change of serpentine textures accompanied with progress of serpentinization observed in serpentinized harzburgite and dunite samples from Iwanai-dake ultramafic body, Hokkaido, Japan. The change of serpentine textures shows serpentinization processes of harzburgite are different from dunite. Serpentine mesh texture of serpentinized harzburgite has two kinds of mesh rim types; type A rim is mixture of serpentine (Mg#97) and brucite (Mg#75), and type B rim consists of only serpentine (Mg#93). Type B rims are always accompanied with brucite-magnetite veins. The formation of type B rims and brucite-magnetite veins are observed concurrently with serpentinization of orthopyroxene. These observations suggest that two-stage reactions occurred during the serpentinization processes of harzburgite, and magnetite was formed by the later-stage reactions, which were triggered by supply of silica component from serpentinization of orthopyroxene. This is consistent with the higher magnetic susceptibility in moderately and highly serpentinized harzburgite than in less serpentinized ones. In case of serpentinized dunite, type A rim was dominantly observed and the amount of magnetite doesn't increase with the progress of serpentinization. These observations suggest that silica supply is a trigger of the later-stage serpentinization reactions, in which magnetite and hydrogen are generated.

Keywords: serpentinite, serpentinization, mineralogical texture, magnetic susceptibility, water content, magnetite