

Petrophysical characteristics of serpentized peridotites of Hole BA1B, BA3A and BA4A

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Structural characteristics within peridotites of Hole BA1B, BA3A and BA4A have been described during the Oman Drilling Project Phase 2 from 5th August to 3rd September, 2018 on D/V Chikyu. The peridotites consisted of intensely serpentized harzburgite and dunite, which exhibited foliations defined by elongation and alignment of constituent minerals. Crystal plastic fabrics in harzburgite were described prior to those in dunite because orthopyroxene grains are clearer than spinel grains in serpentized peridotites at macro scale.

Harzburgites in BA1B show variously deformed textures ranging from porphyroclastic to protomylonitic textures in dependent on the depth. In BA3A, harzburgites with protogranular texture were observed in relatively shallow sections (10-90 m), whereas porphyroclastic to strongly foliated textures were dominant in deeper sections. Most of harzburgites in BA4A show porphyroclastic texture, partly clear foliation and protomylonitic textures by strongly elongated orthopyroxene grains. Dip angles of measured foliations in BA1B are mostly 0-20°, which are nearly horizontal. Most of dip angles in BA3A are at around 30°, up to 50°. In BA4A, dip angles of orthopyroxene grains take various values between 10-50°. In BA3A and BA4A show similar dip angles, but significantly steeper than those in BA1B. In each hole, dip angles were nearly constant independent on the depth.

Pyroxene and spinel grains in strongly foliated to protomylonitic peridotites are intensely elongated and aligned, exhibiting clear foliation at thin section scale. In protogranular peridotites, pyroxene and spinel grains have rounded shapes and are not elongated and aligned, and foliations are unclear. Elongated pyroxene and olivine grains in protomylonitic peridotites show kink bands and wavy extinction, whereas few rounded pyroxene grains in protogranular peridotites show these features.

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