

Physical properties of basalt samples recovered from eastern flank of Juan de Fuca Ridge: results from IODP Expedition 301

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Investigation of evolution of hydrothermally active oceanic crust and its hydrological processes of fluid flow is one of the purposes of drillings of IODP Expedition 301 on the eastern flank of the Juan de Fuca Ridge. In this presentation, we present on physical properties of basalt samples recovered from Hole U1301B drilled during this expedition. Basalt basement in Hole U1301B was cored from 351 to 583 mbsf. Density and moisture properties were determined on 83 discrete samples from this hole. The measured bulk and grain density values are 1.86-3.03 g/cm³ (average: 2.75 g/cm³) and 2.23-3.11 g/cm³ (average: 2.86 g/cm³). Porosity values span the range of 1.9 %-30.3 % (average: 5.8 %). P-wave velocities were measured on 106 discrete samples, yielding values of 3.9-5.8 km/s. Seismic velocity and porosity values are inversely correlated, and velocity displays a weak positive correlation with grain density. Thermal conductivity values were obtained from sixty-eight basalt samples. The measured values are 1.17-1.84 W/mK (average: 1.70 W/mK). There is no statistically significant change in thermal conductivity with depth.