

New Procedure for Shipboard Physical Properties Measurements during Hard Rock Drilling

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During hard rock drilling in the International Ocean Drilling Program (IODP) and the International Coastal Drilling Program (ICDP), shipboard measurements of physical properties have been performed basically according to the procedures of Blum (1997). This is an excellent procedure for the JOIDES Resolution shipboard laboratory, and many valuable data have been obtained by efficiently measuring V_p , density, porosity, magnetic susceptibility, γ -ray intensity, thermal conductivity, etc., with the same quality, even if the measurement personnel change. Many deep-seated rocks drilling expeditions (Exps. 304, 305, 309, 312, 335, 345, and 360) were conducted in IODP Phase I and after, and the measurement methods have been developed to obtain more data efficiently. The physical property measurements were also performed onboard D/V Chikyu during ICDP Oman Drilling Project Phase II in 2018 (CHikyuOman 2018). Electrical resistivity was measured in WR and discrete samples in addition to the previous protocol. On the other hand, reproducibility is required for accurate measurement of physical properties regardless of the measurer. The samples should be fully saturated by long-term soaking for about 30 days, but in order to measure a large number of samples in a short time, water saturation was achieved by soaking the samples in a vacuumed container for more than 24 hours. During ChikyuOman 2018, we cleared these conditions at a minimum and made a large number of measurements. As a result, we obtained meaningful physical property data that can be used for discussion even for samples with low porosity and high resistivity. As a result, we obtained meaningful physical property data for low porosity and high resistivity samples. We would like to improve these physical property measurements further, and measure the physical properties of a large number of samples in the shipboard laboratory immediately after drilling, and use them for more accurate estimation of the subsurface structure by comprehensively interpreting the seismic structure survey, rock core description, and physical properties

Keywords: IODP, physical property measurements, electrical resistivity, ICDP, D/V Chikyu, JOIDES Resolution