

Physical properties of sediment cores and cuttings in Sanrikuoki Basin at Site C0020, IODP Expedition 337

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Physical properties which should be affected by local diagenesis process are very important to evaluate sedimentary formations below the seafloor. A series of physical properties measurements were carried out in laboratory on D/V Chikyu, using core samples and cuttings from a riser drill hole at Site C0020 in northern Sanrikuoki Basin off Shimokita Peninsula. As routine, measurements with multi-sensor core logger were performed, moisture and density (MAD), P-wave velocity and electric resistivity were measured using discrete core samples, and thermal conductivity was measured on half cores. Cuttings recovered by the riser drilling system were also applied to MAD analysis, being separated into four categories: original bulk and sieved size categories of >4.0, 1.0?4.0, and 0.25?1.0 mm. Cubic samples cut off from the cuttings were applied to the P-wave velocity analysis and the electrical impedance analysis. In addition, anelastic strain recovery analysis was made on the vessel using some whole-round cores and vitrinite reflectance analysis was also performed on some coaly samples. As a result of the MAD analysis, porosity of siltstone, sandstone, and shale gradually decreased to the greater depth. Porosity corresponds to lithologic variation. For example, porosity of carbonate-cemented sandstone and siltstone has much lower values than non-cemented sandstone and siltstone. The carbonate-cemented rocks have also higher thermal conductivity than the others, and indicate specific CT values on X-ray computed tomography analysis. The cuttings also show a gradual decrease in porosity but have generally higher values than the core samples. Discrete core samples are likely more representative of in-situ porosity than cuttings. Vitrinite reflectance indicates basically low maturity.

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