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Thermal conductivity of actinide materials measured using the 3ω method KESHAV SHRESTHA, KRZYSZTOF GOFRYK, Idaho National Laboratory — The thermal conductivity of nuclear materials governs the conversion of heat produced from fission events into electricity and it is an important parameter in reactor design and safety. However, it is also a challenging property to measure due to radioactivity and radiotixicity of actinides. Most of the conventional methods require usage of large samples (millimeter size at least) with an appropriate shape. The 3ω-method, developed by Cahill [D. G. Cahill, *Review of Scientific Instruments*, 61, 802 (1990)], is designed to work with small samples and enables to measure thermal conductivity and heat capacity of bulk and thin layered materials. In this work, we have adapted the 3ω method to measure thermal conductivity and heat capacity of various metallic and insulating samples including small single crystals of UO_2 and UN. The validity of this method has been also tested by measuring thermal conductivities of several testing materials (Cu, Pt, Constantan, SiO_2). The new measurement setup has been adapted to be compatible with Quantum Design PPMS system.

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