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Low Temperature heat capacity of Uranium-Plutonium MOX single crystals JEAN-CHRISTOPHE GRIVEAU, ERIC COLINEAU, RACHEL ELOIRDI, ROBERTO CACIUFFO, European Commission, Joint Research Centre (JRC), Institute for Transuranium Elements (ITU), Postfach 2340, D-76125 Karlsruhe, Germany — The establishment of the basic properties of actinides based materials is crucial for the understanding of conventional and advanced nuclear fuels. Accessing ground state properties at very low temperature for these systems gives a direct overview of their fundamental features. Moreover, when these materials can be produced as single crystals, side effects due to the presence of grains and impurities phases are drastically reduced, giving a very powerful add-in for theoretical and industrial oriented studies. This clearly ensures the reliability of the parameters determined while existing models of these strategic materials can be probed especially in the purpose of applications/developments and safety concerns. Here we report on heat capacity measurements performed on U-Pu MOX in single crystal form. Tiny crystals with mass of 2 to 15 mg have been produced by solid-solid chemical vapour transport technique with several different compositions ranging from pure UO_2 to PuO_2. Compositions close to UO_2 (U rich) present a persistent signature similarly to the magnetic transition reported for the pure phase $T_N \sim 31$ K while plutonium rich concentrations do not show any hint of the magnetic transition down to the minimum temperature achieved.

Jean-Christophe Griveau
European Commission, Joint Research Centre (JRC),
Institute for Transuranium Elements (ITU),
Postfach 2340, D-76125 Karlsruhe, Germany

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