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Charge density wave formation and physical properties of R_2Te$_5$ (R=Nd, Gd) compounds[1] K.Y. SHIN, N. RU., Geballe Laboratory for Advanced Materials and Department of Applied Physics, Stanford University, Stanford, California 94305, USA, M.F. TONEY, Stanford Synchrotron Radiation Laboratory, Stanford Linear Accelerator Center, 2575 Sand Hill Road, Menlo Park, California 94025, USA, I.R. FISHER, Geballe Laboratory for Advanced Materials and Department of Applied Physics, Stanford University, Stanford, California 94305, USA — R_2Te$_5$ (R=Nd, Gd) has a layered tetragonal structure based on alternating single and double square planar Te sheets separated by corrugated RTe layers, and has a quasi-two dimensional electronic structure. The material shares important physical properties with other two single and double Te layer variants, RTe$_2$ and RTe$_3$ (R=La Yb), including a charge density wave (CDW) instability. Using a binary self-flux method, we have grown high-quality single crystals of Gd$_2$Te$_5$ and Nd$_2$Te$_5$ compounds and have characterized their structural, thermodynamic and transport properties. Our measurements reveal, for the first time, the charge density wave in this material. We will discuss the properties and origin of the CDW, and the relation to the better known RTe$_2$ and RTe$_3$ compounds.

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