

Abstract Submitted
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Infrared investigation of the charge ordering pattern in the organic spin ladder candidate $(\text{DTTTF})_2\text{Cu}(\text{mnt})_2$ ¹ J.L. MUSFELDT, S. BROWN, University of Tennessee, S. MAZUMDAR, University of Arizona, R.T. CLAY, Mississippi State University, M. MAS-TORRENT, C. ROVIRA, Institut de Ciència de Materials de Barcelona, J.C. DIAS, R.T. HENRIQUES, M. ALMEIDA, Universidade de Lisboa — We measured the variable temperature infrared response of the spin ladder candidate $(\text{DTTTF})_2\text{Cu}(\text{mnt})_2$ in order to distinguish between two competing ladder models, rectangular versus zigzag, proposed for this family of materials. The distortion along the stack direction below 235 K is consistent with a doubling along b through the metal-insulator transition. While this would agree with either of the ladder models, the concomitant transverse distortion rules out the rectangular ladder model and supports the zigzag scenario. A mode analysis provides the microscopic basis for this distortion and an estimate for the degree of charge ordering. Intramolecular distortions within the DTTTF building block molecule also give rise to on-site charge asymmetry.

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