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Fragile Structure Transition in Mo3Sb7 J.-Q. YAN, University of Tennessee, Oak Ridge National Laboratory, M.A. MCGUIRE, A.F. MAY, Oak Ridge National Laboratory, D.G. MANDRUS, University of Tennessee, Oak Ridge National Laboratory, B.C. SALES, Oak Ridge National Laboratory — Despite a relatively low superconducting transition temperature $T_c = 2.08$ K, the Zintl compound Mo_3Sb_7 has attracted considerable interest due to the possible involvement of magnetism in superconducting pairing, and promising thermoelectric performance with proper doping. Mo_3Sb_7 crystallizes in a Ir_3Ge_7-type cubic structure with space group Im3m at room temperature. A structure transition from cubic to tetragonal (I4/mmm) was observed at 53 K and this symmetry lowering is accompanied by the opening of a 120 K spin gap. Here, we will present the growth of Mo_3Sb_7 single crystals and our work in exploring the correlation between the low-temperature superconductivity, the structure transition, and the spin gap. The low-temperature superconductivity was observed in both the cubic and tetragonal phases. The structure transition was found to be extremely sensitive to Te or Ru substitution which shifts the Fermi level toward the valence band edge. Work at ORNL was supported by the U.S. Department of Energy, Basic Energy Sciences, Materials Sciences and Engineering Division.

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