Abstract Submitted
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The search for an E(5) critical-point nucleus among the stable xenon isotopes[1] E.E. PETERS, T.J. ROSS, A. CHAKRABORTY, B.P. CRIDER, A. KUMAR, F.M. PRADOS-ESTÉVEZ, S.F. ASHLEY, M.T. MCELLISTREM, S.W. YATES, Departments of Chemistry and Physics & Astronomy, University of Kentucky — A critical-point has been proposed to exist within the shape/phase transition of the U(5), spherical, and O(6), γ-soft rotor, limits of the IBM. The xenon isotopes exhibit such a transition and have, therefore, been proposed as a chain in which to search for the E(5) critical-point symmetry. The candidacy for an E(5) nucleus has been largely based on the decays of the excited 0^+ states, which for some of the xenon isotopes were not yet known. Inelastic neutron scattering measurements at the University of Kentucky Accelerator Laboratory have been performed using highly enriched (>99.9%) ^{130}Xe, ^{132}Xe, ^{134}Xe and ^{136}Xe gases converted to solid xenon difluorides. From these measurements, new excited 0^+ states and their decays were identified, level lifetimes were measured, and transition probabilities were determined. This new information allows definitive conclusions to be drawn about the occurrence of the E(5) symmetry within the stable xenon isotopes.

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E.E. Peters
Department of Chemistry, University of Kentucky

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