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Evidence for High T_c Superconducting Transitions in Isolated Al_{45}^- and Al_{47}^- Nanoclusters MARTIN JARROLD, BAOPENG CAO, COLLEEN NEAL, ANNE STARACE, Indiana University, YURII OVCHINNIKOV, Landau Institute for Theoretical Physics, VLADIMIR KRESIN, Lawrence Berkeley Laboratory — Heat capacities measured for Al_{45}^- and Al_{47}^- nanoclusters have reproducible peaks at ~ 200 K. The data were obtained using a multi-collision dissociation method [1] allowing us to perform measurements for isolated nanoclusters. The peaks are observed for selected Al clusters only. These peaks are consistent with theoretical predictions that some clusters with highly degenerate electronic states near the Fermi level will undergo a transition into a high T_c superconducting state [2]. An analysis based on a theoretical treatment of pairing in Al_{45}^- and Al_{47}^- agrees well with the experimental data in both the value of the critical temperature and in the size and width of the peaks in the heat capacity. The observed value of T_c exceeds those found in bulk systems. [1] G.Breaux, C.Neal, B.Cao, M.Jarrold, Phys. Rev. Lett. **94**, 173401 (2005) [2] V.Z.Kresin, Yu.Ovchinnikov, Phys. Rev. B **74**, 024514 (2006)

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