

Abstract Submitted
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Formation of weakly bound molecules in buffer-gas cooling experiments with silver atoms N. BRAHMS, T.V. TSCHERBUL, P. ZHANG, Harvard University, J. KLOS, University of Maryland, Y. AU, H.R. SADEGHPOUR, A. DALGARNO, J.M. DOYLE, Harvard University, T.G. WALKER, University of Wisconsin-Madison — The rate for spin relaxation of Ag atoms in cryogenic ^3He gas increases by two orders of magnitude with decreasing temperature from 600 to 300 mK. We argue that the anomalous behavior might be a signature for the formation and decay of weakly bound AgHe dimers. Ab initio calculations of binding energies show that at a temperature of 300 mK, more than 5% of Ag atoms are associated into AgHe molecules. The AgHe dimers undergo rapid spin relaxation in collisions with He or Ag atoms, and the temperature dependence of the spin relaxation rate follows that of the chemical equilibrium coefficient for three-body recombination $\text{Ag} + \text{He} + \text{He} \rightarrow \text{AgHe} + \text{He}$. The impact of weakly bound molecules on cryogenic and sympathetic cooling experiments is discussed. *Phys. Rev.Lett.* **101**, 103002 (2008).

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