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Feshbach Molecule Formation in Finite-Temperature Quantum Gases JAMES E. WILLIAMS, NICOLAI NYGAARD, NIST, TETSURO NIKUNI, Tokyo University of Science, CHARLES W. CLARK, NIST — An exciting development in the field of ultracold atomic gases is the ability to create diatomic molecules by adjusting a Feshbach resonance in the interatomic potential. An extraordinary application of this capability has been to dynamically traverse the BEC-BCS crossover in Fermi gases. While a great deal of attention has focused on equilibrium properties in the *superfluid* regime, a complete theoretical understanding of the dynamics of molecule formation in a *normal* gas is still lacking. In a recent article [Williams *et al.*, J. Phys. B: At. Mol. Opt. Phys. bf37, L351 (2004)], we presented coupled Boltzmann-like kinetic equations for the atoms and molecules. In this talk, we show that our theory can be used to understand why the molecular conversion efficiency increases as the temperature is lowered, as observed in a recent experiment [Hodby *et al.*, cond- mat/0411487].

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