

Abstract Submitted  
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**Factorization in Break-up and Recombination Processes for Atoms with a Large Scattering Length**<sup>1</sup> ERIC BRAATEN, DONGQING ZHANG, Physics Department, The Ohio State University — Break-up and recombination processes for loosely-bound molecules composed of atoms with a large scattering length  $a$  necessarily involve interactions that are nonperturbative in the exact 2-body interaction. If these processes involve atoms with relative momenta much larger than  $\hbar/|a|$ , the leading contributions to their rates can be separated into short-distance factors that are insensitive to  $a$  and long-distance factors that are insensitive to the range of the interaction. In the case of inclusive break-up cross sections for atom-molecule scattering, the short-distance factors are atom-atom cross sections at a lower collision energy and the long-distance factors simply count the number of atoms in the molecule.

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