Factorization in Break-up and Recombination Processes for Atoms with a Large Scattering Length\textsuperscript{1} 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.

\textsuperscript{1}This research was supported in part by the Department of Energy under grant DE-FG02-91-ER4069.