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Ultracold collisions between atoms and molecules in high vibrational states: effect of the atom-atom scattering length GOULVEN QUÉMÉNER, University of Nevada Las Vegas, PASCAL HONVAULT, University of Franche-Comte, JEAN-MICHEL LAUNAY, University of Rennes 1 — Recently, Bose-Einstein condensates of $^6Li_2$ and $^{40}K_2$ molecules have been produced using Feshbach resonances and Pauli blocking mechanism. In these experiments, molecules are formed in the highest vibrational state and composed by fermionic atoms, and the atom-atom scattering length is large and positive. Using a quantum-mechanical formalism based on hyperspherical coordinates, we have obtained elastic and inelastic rate coefficients for the fermionic system $^6Li + {}^6Li_2$ and for the bosonic system $^7Li + {}^7Li_2$ for molecule in high vibrational states [1]. We explain the Pauli blocking mechanism that occurs in the experiments, by comparing rate coefficients for a system composed of bosonic or fermionic atoms as a function of the atom-atom scattering length. [1] G. Quéméner, J.-M. Launay, and P. Honvault, Phys. Rev. A **75**, 050701(R) (2007).

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