

# Ultracold He+CO collisions involving highly excited rotational and vibrational initial states

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## Abstract

Ultracold He collisions with internally hot CO molecules are investigated using the quantum mechanical coupled channel, coupled states, and effective potential scattering formulations. Quenching rate coefficients are given for initial rotational levels near the dissociation threshold. Strong resonant and quasis resonant structure is found in the cross sections at low temperatures. The results are compared with previous calculations for He+H<sub>2</sub> and He+O<sub>2</sub>. Time-dependent relaxation of an initial Gaussian distribution of rotational states, such as might be produced by an optical centrifuge, is studied and an emission spectra which contains the collisional information is predicted.

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