

Collisional Quantum Interference on Rotational Energy Transfer: Relation Between Integral Interference Angle and Rotational Quantum Number in Na_2 -Na System

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Abstract: Collisional quantum interference (CQI) on rotational energy transfer was observed in $\text{Na}_2(A_1\Sigma_u^+, v=8 \sim b^3\Pi_{0u}, v=14)$ system in collision with Na [Chem. Phys. Lett. 318 (2000) 107], and the degree of the interference was measured. The integral interference angle was obtained through theoretical calculation. We will research the factors that have effect on collisional quantum interference on rotational energy transfer in our studied system. Based on the time-dependent first order Born approximation, and taking into account the anisotropic Lennard-Jones interaction potentials and "straight-line" trajectory approximation, we obtain the factors that have effect on CQI in Na_2 -Na system, and obtain the relation between the integral interference angle and rotational quantum number.

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Key words: rotational energy transfer, interference angle, rotational quantum number

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