A Search for Isotope Effects in Chemiluminescent Reactions of Metastable Ca*(^3P_J, $^1D_2$) Atoms with CH_3I and CD_3I Molecules

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Chemiluminescent reactions of calcium atoms in the metastable ^3P_J and $^1D_2$ states with CH_3I and CD_3I were studied in a beam-gas arrangement. Calcium monoiodide spectra associated with transitions from the electronic A $^2\Pi$, B $^2\Sigma^+$ and C $^2\Pi$ states to the X $^2\Sigma^+$ ground state were recorded. Total collision and chemiluminescence cross sections were measured. It was found that isotopic substitution in the methyl group does not change the reaction cross sections and the chemiluminescence spectra.

Key words: Chemiluminescence; Energy Transfer; Atomic Collisions; Molecular Collisions; Isotopic Effect.

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