On the "Expanded Local Mode" Approach Applied to the Methane Molecule: Isotopic Substitution $CH_3D \leftarrow CH_4$ and $CHD_3 \leftarrow CH_4$

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The operator perturbation theory and symmetry properties of an axially symmetric XYZ_3 (C_{3v}) type molecule are used to determine of its spectroscopic parameters in the form of functions of structural parameters and parameters of the intramolecular potential function. On that basis, different relations between sets of spectroscopic parameters of a molecule are obtained. Compilation of the "expanded local mode" model and the general isotopic substitution theory is used for the estimation of relations between spectroscopic parameters of the CH_3D and CHD_3 molecules, on the one hand, and their mother isotopic species, CH_4, on the other hand. Test calculations with the isotopic relations derived show that, even with a total absence of initial information about the CH_3D and CHD_3 species, numerical results of our calculations are in a good agreement both with experimental data for these molecules, and with results of *ab initio* calculations.