This survey was undertaken (a) to test the suitability of the program Gaussian 03 (G03) for anharmonicity calculations: (b) to compare results for different models (B3LYP, MP2) and basis sets (6-311++G**, cc-pVTZ); (c) to see if anharmonicity corrections to harmonic frequencies were identical for different types of C-H stretching vibration. Results to be presented show that the version of G03 available was inadequate to detect familiar instances of Fermi resonance. For $C_3v$-type molecules G03 yielded anharmonicity constants $\alpha_{i,j}$ unusable by the experimentalist. In $\text{CH}_2\text{Cl}_2$ the antisymmetric C-H stretching frequency is associated with a larger anharmonicity correction than is the case for the C-H stretch, in a situation where Fermi resonance is negligible. Calculated values of $\alpha_{1,1}$, $\alpha_{1,6}$ and $\alpha_{6,6}$ for $\text{CH}_2\text{Cl}_2$ agree excellently with experimental data. In ethylene a marked effect of basis set was found in MP2 calculations for the out-of-plane bending modes, linked to the presence or absence of $f$ functions.