REGULARITIES IN VIBRATIONAL SPECTRA OF 1-*TERT*-BUTYL AND 1,2-DI-*TERT*-BUTYL DERIVATIVES OF 3,3-DIMETHYLCYCLOPROPENE AND THEIR SILICON, GERMANIUM, AND TIN ANALOGUES

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The changes in the vibrational frequencies of 1-*tert*-butyl and 1,2-di-*tert*-butyl derivatives of 3,3-dimethylcyclopropene which occur when the central carbon atoms of the *tert*-butyl moieties are substituted by silicon, germanium, or tin atoms are examined. The major decrease in the vibrational frequencies concerned (first of all the frequencies of moieties implicating the hetero atoms) is noted for the substitution of the C atom by the Si atom. Indeed, the shifts of these vibrational frequencies on going from the silicon analogue to the germanium one and from the germanium analogue to the tin one are not as pronounced as those for the C $\rightarrow$ Si transition.[a,b] An explanation is given for such characteristic changes in these vibrational frequencies for the transitions C $\rightarrow$ Si $\rightarrow$ Ge $\rightarrow$ Sn. The formation of cluster regions in the vibrational spectra is shown for the frequencies of the stretching vibrations of the SnC_3 moieties. It is concluded that the vibrational frequencies corresponding to moieties containing the hetero-atoms tend towards lower limiting values as the mass of the isovalent atoms is increased.

[a] Yu. N. Panchenko, G. R. De Maré, A. V. Abramenkov, M. S. Baird, V. V. Tverezovsky, A. V. Nizovtsev, and I. G. Bolesov, *Spectrochim. Acta*, **59A**, 1733 (2003) (and references therein).

[b] G. R. De Maré, Yu. N. Panchenko, A. V. Abramenkov, M. S. Baird, V. V. Tverezovsky, A. V. Nizovtsev, and I. G. Bolesov, *Spectrochim. Acta*, **60A**, 519 (2003) (and references therein).