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Note on the Infrared Spectra of Pro- γ -carotene and Neo- γ -carotene P

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These two *cis* isomers of γ -carotene are natural products and can be isolated easily from ripe berries of *Pyracantha angustifolia*^{1,2}. In the visible spectral region, hexane solutions of pro- γ -carotene show two almost equal maxima (434, 457 m μ) while the neo- γ -carotene curve contains only a single main maximum (459 m μ)^{3,4}. In spite of this difference a comparison of the infrared spectra showed near-identity⁴.

Although, as was pointed out⁴, several pairs of *cis* forms are possible in this sterically unsymmetrical set whose IR spectra are expected to be (almost) identical, an experimental error such as mislabeling of samples could not be excluded considering the great number of stereoisomeric carotenoids studied.

At the recommendation of Prof. L. Zechmeister, the author has now reinvesti-

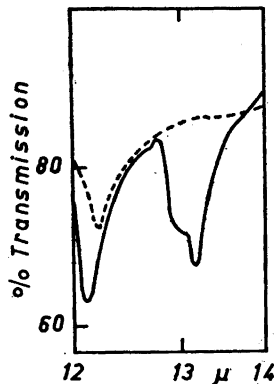


Fig. 1. Infrared spectra of: —, neo- γ -carotene P and - - -, pro- γ -carotene (1% solutions in carbon disulfide, 1.0 mm cells).

gated the IR spectra using solutions of authentic samples of pro- γ -carotene (m. p. 133–134°) and neo- γ -carotene P (m. p. 89–90°). The identity of the two curves was confirmed in the 2–12 μ region; an important difference was observed, however, in the 12–14 μ region. As Fig. 1 shows, only the neo P curve possesses a band at 13.02–13.19 μ (doublet). This band lies in the region that has been assigned to unmethylated *cis* double bonds⁴. Consequently, our earlier interpretations must be revised. It is proposed that the neo- γ -carotene P molecule contains both methylated and unmethylated *cis* double bond(s) while the latter type is absent from pro- γ -carotene. This difference has a profound influence on the spectra observed in the visible region.

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