

Nomenclature of Carotenoids (Recommendations 1974)¹

IUPAC Commission on the Nomenclature of Organic Chemistry²
IUPAC-IUB Commission on Biochemical Nomenclature³

In 1971–1972 IUPAC and IUB published Tentative Rules (retroactively termed “Provisional Rules 1971”) for the Nomenclature of Carotenoids [IUPAC *Information Bulletin*, Appendix 19, February 1972; *Biochemistry* (1971), 10, 4827; *Eur. J. Biochem.* (1972), 25, 397; *Biochem. J.* (1972), 127, 741; *Biochim. Biophys. Acta* (1972), 286, 217; *J. Biol. Chem.* (1972), 247, 2633].

These Rules have now been revised by the relevant Commissions of the two Unions (CNOC² and CBN³) and are being published in full by IUPAC in *Pure and Applied Chemistry*.

To save space in Journals, IUB presents here only the changes, which are relatively minor. The only points of scientific, as distinct from “editorial”, interest are the inclusion of some C₃₇ (trinor) carotenoids (in Rule 5 and in the Appendix) and of another type of end group (in Rule 3).

A symposium on Carotenoids, to be sponsored by IUPAC, is to be held in Bern, Switzerland, in August 1975. It is hoped that this will provide an opportunity for extending the Rules to cover other classes of carotenoids, and for making any further necessary amendments to the existing Rules.

Rule 1. Replace penultimate paragraph (“This class includes certain compounds that arise from certain rearrangements or degradations of the carbon skeleton (I), provided that the two central methyl groups are retained. This excludes retinol (vitamin A) and related C₂₀ compounds”) by “This class also includes certain compounds that arise from certain rearrangements of the carbon skeleton (I) or by the (formal) removal of part of this structure.”

Rule 2. Replace reference to structures, which reads “(such as IV, V, VI, VII, and VIII)”, by “(such as IV–IX)”.

Rule 3. (i) Add to the table

Methylenecyclohexane	γ	C ₉ H ₁₅	VI
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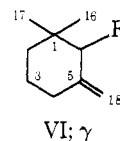
and change VI to VII, and VII, VIII to VIII, IX.

(ii) Add to the list of “end-group modifications”

¹ Approved by IUPAC and IUB in 1974 and published by their permission. Reprints of this document and of the preceding Tentative (Provisional) Rules, to which it is now added to form (IUPAC) “Rules approved 1974” or (IUB) “Recommendations 1974”, may be obtained from the NRC Office of Biochemical Nomenclature (W. E. Cohn, Director), Biology Division, Oak Ridge National Laboratory, P.O. Box Y, Oak Ridge, Tenn. (U.S.A.) 37830.

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VI; γ

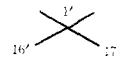
and renumber VI, VII, VIII to VII, VIII, IX, respectively (together with their Greek-letter designations); also, *trans*-pose locants on structures IV and V to read



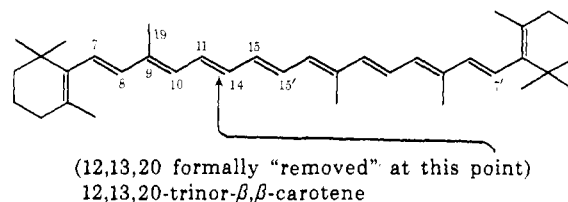
Rule 3.3. In “Note”: add after “ β (beta)”, “ γ (gamma)”. In “Notes (i)”: change “ ψ from ψ -ionone” to “ γ and ψ from γ - and ψ -ionone”. In “Notes (ii)”: delete “ γ -” twice.

Rule 4. Footnote 4: in the sequence “ x, x ”, etc., change the second x to x' .

Rule 5(a). (i) Renumber as 5.1. (ii) Transpose locants 16' and 17' at right-hand end of first example, to read



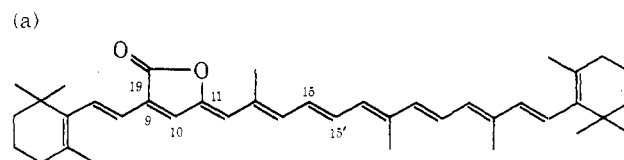
(iii) Add this example between the two existing ones:



(iv) Footnote 5: change “1967 Revised” to “1971 Definitive”; change “IUPAC Information Bulletin No. 33” to “*Pure Appl. Chem.*, 31, 285 (1972)”; after “(1969)” add “and 10, 4994 (1971)”.

Rule 5(b). Renumber as 5.2.

Rule 8.2. Add this second example between the present (a) and (b):



β, β -caroten-19,11-olide

(the position of the lactone group is indicated following the principles of IUPAC Rule⁴ C472.2)

Rule 12.2. Formula for fucoxanthin should have the ring with *unprimed* locants at the left, as in the appendix. The semisystematic name and numbering are correctly stated.

Rule 12.4. Change “ β or ϵ ” to “ β, γ , or ϵ ”.

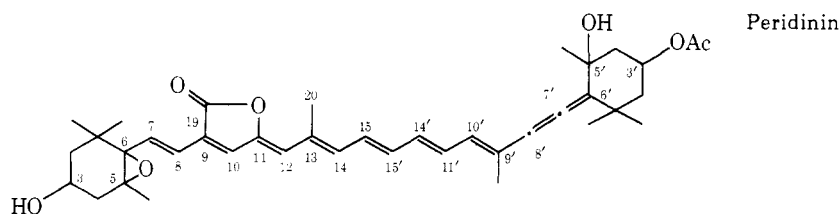
Rule 13. Paragraph 3 (“while the need to coin a new

trivial name must occasionally arise (e.g., because the structure of the compound is unknown), the list in the appendix should not be unnecessarily enlarged, nor should simple derivatives of known carotenoids be named by use of the trivial name or given a new one") now *ends* at "enlarged", with a second sentence following, which reads: "Simple derivatives of known carotenoids should not be given new trivial

names; they may, however, be named by modification of existing trivial names (cf. Steroid Rule⁵ 2S4.2, Note), but the full semisystematic name, formulated according to these Rules, should be given for each compound at its first mention in each paper".

Appendix. Add at end of section "Nor and Seco Carotenoids"

3'-Acetoxy-5,6-epoxy-
3,5'-dihydroxy-6',7'-
didehydro-5,6,5',6'-
tetrahydro-12',13',20'-
trinor- β,β -caroten-
19,11-olide



5,6-Epoxy-3,3'-di-
hydroxy-7',8'-didehy-
dro-5,6-dihydro-12',
13',20'-trinor- β,β -
caroten-19,11-olide

