

SYNTHESIS OF SPHEROIDENE, SPHEROIDENONE, AND "P518"

P.S. Manchand and B.C.L. Weedon

Queen Mary College

London, England.

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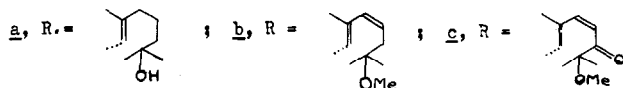
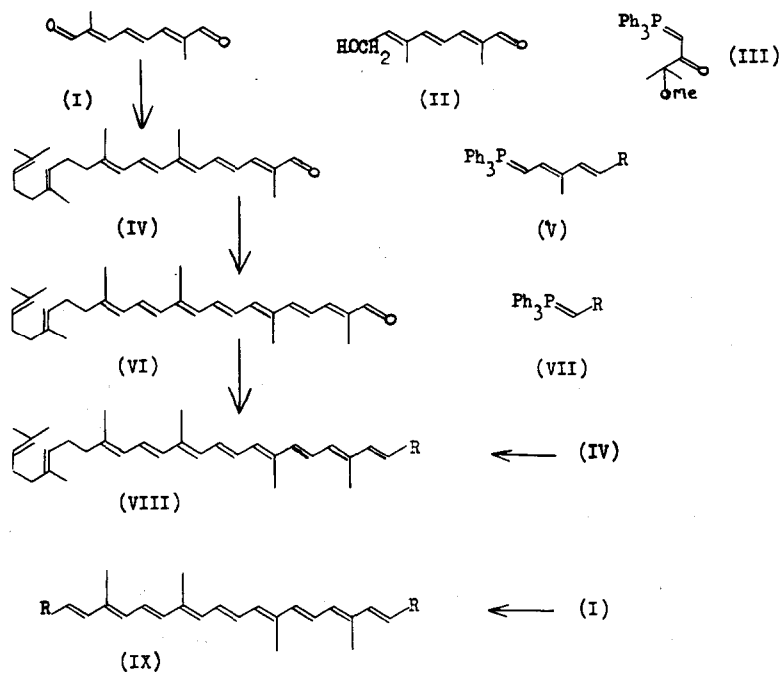
Following our recent synthesis of chloroxanthin (VIII a)¹, we now report similar confirmation of the structures assigned^{2,3} to three other carotenoids of the photosynthetic bacteria Rhodospseudomonas spheroides.

Treatment of the C₃₀-aldehyde (VI)¹ with the Wittig reagent (VII b)⁴ gave spheroidene (VIII b), m.p. 135-138°; λ_{\max} . 485, 454, and 427 m μ ; ν_{\max} . 1080 and 983 cm⁻¹; τ 8.87, 8.41, 8.33, 8.21, 8.10, 8.04, and 6.79, relative intensities ca. 2:2:1:1:1:3:1.

Reaction of methylene triphenylphosphoran with the acid chloride of α -methoxyisobutyric acid⁵ led to the reagent (III) which was condensed with the hydroxy-aldehyde (II).⁶ The product was converted into the phosphoran (V c) which reacted with the C₂₅-aldehyde (IV)¹ to give spheroidenone (VIII c), m.p. 166-167°; λ_{\max} . 513, 482, and 461 m μ ; ν_{\max} . (CCl₄) 1680, 1600, 1080, and 980 cm⁻¹; τ 8.65, 8.39, 8.33, 8.18, 8.03, and 6.78, relative intensities ca. 2:2:1:1:4:1.

Condensation of (V c) with the dialdehyde (I)⁷ gave "P518" (IX c), m.p. 214-218°; λ_{\max} . 553, 518, and 485 m μ ; ν_{\max} . 1665, 1605, 1078, and 985 cm⁻¹; τ 8.67, 8.02, and 6.79, relative intensities ca. 2:3:1.

The three products were shown to be identical with authentic samples of the carotenoids by direct comparison (partly by Dr. S.L. Jensen); their molecular formulae were established by mass spectrometry (Dr. E.S. Waight). Visible light absorption spectra



were determined in light petroleum; infra-red and n.m.r. data in chloroform and deuteriochloroform respectively, unless otherwise stated. An alternative synthesis of "P518" has recently been completed by Dr. U. Schwieter (private communication).

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