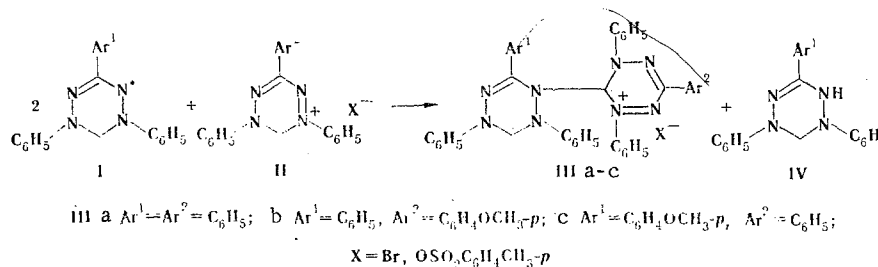


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Verdazyl [2,4-diphenyl-6-aryl-3,4-dihydro-sym-tetrazin-1(2H)-yl] radicals I and verdazylium salts II are readily interconvertible; in studies of the reactions of these compounds they are often simultaneously present in solution [1]. We have found that I and II in relatively concentrated solutions react with one another to give 1,5-diphenyl-3-aryl-6-(2,4-diphenyl-6-aryl-1,2,3,4-tetrahydro-sym-tetrazin-1-yl)-5,6-dihydro-sym-tetrazinium salts III and leucoverdazyls:



Salt II evidently acts as a CH acid in this reaction.

A solution of verdazyl radical I (~ 0.2 mole) and salt II (~ 0.1 mole) in dry acetonitrile was refluxed for ~ 20 min, after which the mixture was diluted with absolute ether, and salt III precipitated in the form of fine brown crystals in $\sim 85\%$ yield. Salt IIIa ($\text{X} = \text{Br}$) had mp $220-222^\circ\text{C}$ (dec.). IR spectrum (KBr): 1600 ($\text{C}=\text{N}$) and 2900 cm^{-1} (CH_2). Electronic spectrum (CH_3CN): λ_{max} 490 nm ($\log \epsilon$ 4.37). PMR spectrum (CF_3COOH): $6.6-8.0$ (m, 30 aromatic H + 6-H) and 5.2 ppm (s, 2H, CH_2).

Leucoverdazyls IV were isolated in $\sim 90\%$ yields in the form of hydrochlorides [2] by the addition of concentrated hydrochloric acid to ether solutions.

Salts III were stable in the solid state. In aqueous acetonitrile they are rapidly hydrolyzed and oxidized, and bright-blue salts precipitate. A salt with the composition $\text{C}_{40}\text{H}_{33}\text{BrN}_8\text{O}$ was obtained from IIIa ($\text{X} = \text{Br}$). Electronic spectrum (CH_3CN): λ_{max} 655 nm ($\log \epsilon$ 4.11). Treatment of a solution of this salt (or IIIa) in CH_3CN with aqueous alkali gave velvet-green crystals of the $\text{C}_{40}\text{H}_{32}\text{N}_8\text{O}$ base. Electronic spectrum (CH_3CN), λ_{max} ($\log \epsilon$): 585 (4.08), 845 (4.14), and 925 nm (4.12). Molecular weight (M) (by the Rast method) 645 ; the calculated value was 640.5 .

Verdazyl radicals and verdazylium salts undergo virtually no reaction with one another in solutions at low concentrations ($\sim 10^{-4}$ mole/liter).

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