

SYNTHESIS OF PYRIDAZINO[4,5-e][1,3,4]THIADIAZINE, PYRIDAZINO[4,5-e]
[1,3,4]OXADIAZINE, AND PYRAZOLO[3,4-d]PYRIDAZINE DERIVATIVES

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Synthesis of some derivatives of the novel rings, pyridazino[4,5-e][1,3,4]thiadiazine and pyridazino[4,5-e][1,3,4]oxadiazine, and ring contraction in the former system to the pyrazolo[3,4-d]pyridazine derivatives, have been described.

5-(α -Bromobenzylidenehydrazino)-4-halo-2-substituted 3(2H)-pyridazinones(Ia-d) (a: 2-methyl-, b: 2-benzyl-, c: 2-phenyl-4-chloro, d: 2-methyl-4-bromo) reacted with potassium thioacetate in boiling acetonitrile to yield 4-acetyl-2-phenyl-7-substituted pyridazino[4,5-e][1,3,4]thiadiazin-8(7H)-ones(Ia-c) (a: 7-methyl, mp 213-215°, 35%, b: 7-benzyl, mp 151-152°, 38%, and c: 7-phenyl, mp 178-180°, 30%, respectively). On acidic hydrolysis, these products(Ia-c) easily afforded the corresponding 4-H derivatives(Id-f) (d: 7-methyl, mp 225-226°, 96%, e: 7-benzyl, mp 219-220°, 37%, f: 7-phenyl, mp 235-236°, 93%).

Not merely any of the compounds(Id-f), but each of the acetyl derivatives(Ia-c) was satisfactorily converted, in similar basic conditions except the reaction temperature, through extrusion of sulphur, into the corresponding 1-H-3-phenyl-5-substituted pyrazolo[3,4-d]pyridazin-4(5H)-ones(IIId-f) (d: 5-methyl, mp 258°, e: 5-benzyl, mp 199-200°, f: 5-phenyl, mp 276-278°). Such a ring contraction was also thermally demonstrated on each of the compounds(Id-g) (g: 4,7-dimethyl) and observed on Id a first order reaction kinetics with $k_{\text{obs}} = 2.43 \times 10^{-4} \text{ sec}^{-1}$ and $t_{1/2} = 47.5 \text{ min}$ (in DMF at $153.5 \pm 0.3^\circ\text{C}$).

Heating 5-(2-benzoyl-1-methylhydrazino)-4-chloro-2-substituted 3(2H)-pyridazinones(2a-c) (a: 2-methyl, b: 2-benzyl, c: 2-phenyl) for 2.5 hrs in DMF in the presence of triethylamine and sodium hydroxide, successfully performed cyclisation to 4-methyl-2-phenyl-7-substituted pyridazino[4,5-e][1,3,4]oxadiazin-8(7H)-ones(IIa-c) (a: 7-methyl, mp 188.5-190.5°, 57%, b: 7-benzyl, mp 158-160°, 59%, and c: 7-phenyl, mp 220-221°, 70%, respectively).