

REACTIONS OF 1-SUBSTITUTED-1H-PYRAZOLO[3,4-d]PYRIMIDINES WITH ACTIVE METHYLENE COMPOUNDS AND KETONE IN THE PRESENCE OF SULFURIC ACID

Takeo Higashino, Yoshihisa Iwai, and Eisaku Hayashi
Shizuoka College of Pharmacy, 2-2-1 Oshika, Shizuoka

Transformation of 1H-pyrazolo[3,4-d]pyrimidines into 1H-pyrazolo[3,4-b]pyridines by the reactions of 1-methyl- (Ia) and 1-phenyl-1H-pyrazolo[3,4-d]pyrimidine (IIa) with active methylene compounds and ketone in the presence of sulfuric acid were reported.

Thus, Ia reacted with malononitrile (1), ethyl acetoacetate (3), acetone (6), cyclopentanone (7), cyclohexanone (8), and acetophenone (9) in the presence of sulfuric acid to give 6-amino-1-methyl-1H-pyrazolo[3,4-b]pyridine-5-carbonitrile (IIIa), ethyl 1,6-dimethyl-1H-pyrazolo[3,4-b]pyridine-5-carboxylate (IIIc), 1,6-dimethyl-1H-pyrazolo[3,4-b]pyridine (IIIf), 1-methyl-1,5,6,7-tetrahydrocyclopenta[e]pyrazolo[3,4-b]pyridine (IIIg), 1-methyl-5,6,7,8-tetrahydro-1H-pyrazolo[3,4-b]quinoline (IIIh), and 1-methyl-6-phenyl-1H-pyrazolo[3,4-b]pyridine (IIIi), respectively. Similarly, IIa reacted with 3, ethyl benzoylacetate (4), 6, 7, 8, and 9 to give ethyl 6-methyl-1-phenyl-1H-pyrazolo[3,4-b]pyridine-5-carboxylate (IVc), 1,6-diphenyl-1H-pyrazolo[3,4-b]pyridine (IVd), 6-methyl-1-phenyl-1H-pyrazolo[3,4-b]pyridine (IVf), 1-phenyl-1,5,6,7-tetrahydrocyclopenta[e]pyrazolo[3,4-b]pyridine (IVg), 1-phenyl-5,6,7,8-tetrahydro-1H-pyrazolo[3,4-b]quinoline (IVh), and IVd, respectively.

Same transformation has also developed in the reaction of 1-methyl- (Ib) and 1-phenyl-5-methyl-1H-pyrazolo[3,4-d]pyrimidinium iodide (IIb) with active methylene compounds and ketone in n-butanol.

Thus, Ib reacted with 1, 3, acetylacetone (5), 6, 7, 8, and 9 to form IIIa, IIIc, 5-acetyl-1,6-dimethyl-1H-pyrazolo[3,4-b]pyridine (IIIe), IIIf, IIIg, IIIh, and IIIi, respectively. Similarly, the reaction of IIb with 1, 2, 3, 5, 6, 7, 8, and 9 gave 6-amino-1-phenyl-1H-pyrazolo[3,4-b]pyridine-5-carbonitrile (IVa), ethyl 6-amino-1-phenyl-1H-pyrazolo[3,4-b]pyridine-5-carboxylate (IVb), IVc, 5-acetyl-6-methyl-1-phenyl-1H-pyrazolo[3,4-b]pyridine (IVe), IVf, IVg, IVh, and IVi, respectively.