EFFICIENT SYNTHESIS OF 3-FORMYL-1,2,4-TRIAZOLE NUCLEOSIDE USING DIETHOXYACETONITRILE AS A SYNTHON

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Biological activity of nucleosides having formyl group in ghe base moiety is of current interest, and certain azole nucleosides have significant biological activity. It has been shown that diethoxyacetonitrile 1 is an efficient synthon for the construction of such heterocyclic moiety structurally related to the two kinds of nucleosides.

Imidate 2 prepared from 1 in the presence of NaOMe was treated with equiv of formylhydrazine in MeOH and refluxed for 14 h to give 1,2,4-triazole 3 in 90% yield. Acetal group of 3 was hydrolyzed to 1,2,4-triazole-3-carboxaldehyde 4 in 93% yield.

Furthermore, 2 was reacted with hydrazone of 2,3-O-isopropylidene-D-ribose to afford 5, which was directly treated with triethyl orthoformate to form 1,2,4-triazole nucleus. Thus, 6 was obtained in 39% overall yield. Its diethoxyl and isopropylidene groups were hydrolyzed to give 7 in 68% yield. The present method is completely regiospecific for the nitrogens and stereospecific for the glycosylation.