Reactivity of Thioaldehyde: Cyclization Reaction of 6-Amino-1,3-dimethyl-5-thioformyluracil with Enamines into Pyrido[2,3-\(d\)]pyrimidine2,4-(1H,3H)-diones.
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The reaction of 6-amino-1,3-dimethyl-5-thioformyluracils with enamines was studied. The 6-amino-5-thioformyluracil reacted as a diene with electron-rich morphorino enamines under mild conditions to give pyrido[2,3-\(d\)]pyrimidine derivatives. The reactivity can be reduced by the placement of phenyl groups on the enamine. The 5-thioformyluracil would be cyclized formally as a diene with the enamines.

Reactivities of 6-Amino-1,3-dimethyl-5-thioformyluracil toward Nucleophiles and Its Application to Synthesis of Pyrido[2,3-\(d\)]pyrimidines.
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Reactivity of the thioformyl group of 6-amino-1,3-dimethyl-5-thioformyluracil toward nucleophiles was investigated in comparison with that of the corresponding 5-formyluracil. The reaction of the 5-thioformyluracil with phenylhydrazine, various amines, and carbanions [\(\text{CH(CN)}_X : X = \text{CN, COOEt}\)] readily afforded the hydrazone, Schiff bases, and pyrido[2,3-\(d\)]pyrimidines, respectively. The thioaldehyde possess much higher reactivities toward nucleophiles than the corresponding aldehyde.

Chemoselective Inhibition of the Hydrogenolysis of the MPM Protective Group for Phenolic Hydroxy Functions Using a Pd/C-Pyridine Catalyst.
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It was found the addition of pyridine to the Pd/C-catalyzed reduction system inhibited the deprotection of a MPM (4-methoxybenzyl) protective group for the phenolic hydroxy groups, although phenolic benzyl ether, Cbz, benzyl ester, nitro and olefin functions were easily hydrogenated. This is a reducible method for the selective hydrogenation of reducible functions distinguishing from the MPM group. The MPM group could be extensively applied to chemoselective hydrogenation as a protecting group for phenolic hydroxy functions by employment of the Pd/C-pyridine catalyst.

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The reduction of 2',3'-O-isopropylidene protected purine nucleosides with diisobutyraluminum hydride (DIBAL-H) caused the cleavage of the C-1'-O-4' bond in the ribose moiety to give the corresponding 9-D-ribitylpurines. The DIBAL-H reduction of inosine, thiouracine, and their derivatives having an alkyl group at the O5'- or S-position proceeded in good yields, whereas the introduction of methyl group into the N'-position of adenosine remarkably reduced the reactivity to afford ribityl derivatives in low yields. The reduction of both 5'-deoxy and S'-chloro-5'-deoxy purine nucleosides under similar conditions gave ribityl derivatives as well as that of 5'-hydroxy derivatives. An acyclic analog of guanosine, which is biologically interesting, was prepared from the guanosine derivative in a similar way. The present methodology for the synthesis of acyclic purine nucleosides was applied to the preparation of an acyclic analog of neplanocin A.