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## Phosphorus, Sulfur, and Silicon and the Related Elements

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### Reactions of Azides of Sugars with Derivatives of Tri-Valent Phosphorus Leading to N-Phosphorylated Sugars

N. A. Buina<sup>a</sup>; G. M. Husnullina<sup>a</sup>; I. A. Vuretdinov<sup>a</sup>; A. E. Arbuzov<sup>a</sup>

<sup>a</sup> Institute of Organic and Physical Chemistry, Academy of Sciences of the USSR, Kazan, USSR

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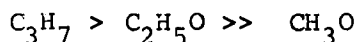
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## REACTIONS OF AZIDES OF SUGARS WITH DERIVATIVES OF TRI- VALENT PHOSPHORUS LEADING TO N-PHOSPHORYLATED SUGARS

N.A.BUINA, G.M.HUSNULLINA, and I.A.NURETDINOV  
A.E.Arbutov Institute of Organic and Physical Chemis-  
try, Academy of Sciences of the USSR, Arbutov Str. 8,  
Kazan 420003, USSR

This communication deals with a simple method for pre-  
paration of N-phosphorylated sugars by the reaction of tri-  
valent phosphorus derivatives with 1- $\alpha,\beta$ -azides of 2,3,4,6-  
-tetraacetylated and 2,3,4,6-tetra(trimethyl)silylated gly-  
cose. It has been established that phosphimine derivatives,  
obtained as a result of the Staudinger reaction, can be  
easily hydrolyzed to give derivatives of acetylated glucos-  
aminphosphoric acids. It has been discovered that suscep-  
tibility to hydrolysis depends on the phosphorus substitu-  
ents. When using esters of trivalent phosphorus the rate of  
hydrolysis for compounds with alkyl substituents decreases  
in order



This can probably be explained by the electronic and ste-  
ric influence of the alkyl groups.

The interaction of above mentioned azides with hexa-  
ethyltriamidophosphite results in stable phosphazide deri-  
vates confirmed by the NMR- and IR-spectroscopy data, and  
by elemental analysis.

$^1\text{H}$ ,  $^{31}\text{P}$  NMR-spectroscopy showed that when the reaction  
product of  $\beta$ -azides of tetraacetylated glucose with di-  
ethylenimide of ethylphosphorous acid was hydrolyzed, an  
intermediate compound with a phosphorane structure was  
produced, which then disintegrated with the splitting of  
the P-N-bond and with elimination of the ethylenimine group.