

**Title: Phosphate basicity and nucleophilicity loss upon constraint: The role of the alkoxy oxygens**

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**Abstract:**

Structural evidence is cited which suggests that the POC angle is more flexible than the OPO angle when phosphate ester alkoxy groups are constrained into rings. In hybridization terms, the tendency for the POC angle to decrease from ca. 120° in acyclic systems to probably less than 115° in O = P(O)(OCH2)2CH is consistent with the notion that an sp2 alkoxy oxygen is less capable of pi bonding to phosphorus and consequently the negative charge on the phosphorus and hence also on the phosphoryl oxygen is decreased. The difference in orbital configurations in acyclic phosphates and in monocyclic and bicyclic analogues has an effect which is seen to re-enforce the hybridization argument. These simple considerations are shown to account for the bulk of the evidence demonstrating that phosphate ester nucleophilicity and basicity decreases on constraint of these systems. The “hinge effect” described above for oxygen in phosphates also appears to play a role in varying the basicities of phosphites and also possibly in the acidity changes in certain borate derivates on constraint. Nitrogen apparently also displays a “hinge effect” in several amino phosphine systems.

**Biography**
xxxx has a Personal Chair in Chemistry at Illinois Institute of Technology, Chicago. Has 25 years’ experience as an Chemist at Iowa State University, USA. Current research of the group involves design, synthesis and SAR studies of modified nucleosides and nucleotides, as well as other heterocyclic compounds, with a wide range of biological properties, especially antiviral, anticancer, antibacterial, antiparasitic, and anti-inflammatory. he rejoined the research team of Prof. Antony Rodey at IOCB and in March 2005 he established his Junior Research Group within Organic chemistry. Since January 2010, he is the head of the Senior Research Group at OCB.(Up to 100 words)

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