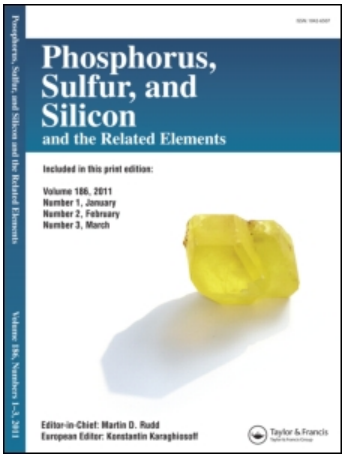

Phosphorus, Sulfur, and Silicon and the Related Elements

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Phosphorylation Within DNA Duplexes. Synthesis of Modified Oligodeoxyribonucleotide

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PHOSPHORYLATION WITHIN DNA DUPLEXES. SYNTHESIS OF MODIFIED OLIGODEOXYRIBONUCLEOTIDE

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An effective method was suggested for the activation of phosphomonoester groups in nicks of a double-strand DNA (1,2). This approach allows to incorporate various sugar phosphate backbone modifications at a particular site when DNA duplexes are being assembled. A modifying group is first introduced at the 5'- or 3'-termini of oligonucleotides, then a duplex is formed and oligomers are coupled on the complementary template using water-soluble 1-ethyl-3-(3'-dimethylaminopropyl)carbodiimide or cyanogen bromide as the condensing agents. Various DNA duplexes containing not only natural phosphodiester but also phosphoramidate and pyrophosphate internucleotide bonds, as well as phosphodiester bonds between nucleotide residues with modified sugar analogs (ribo-, arabino- and xylo-derivatives) were assembled by this method.

The initial oligonucleotides with modified 3'- or 5'-terminal residues were synthesized according phosphoamide chemistry using a "Victory-4M" gen-synthesizer.

On the basis of "chemical ligation" data in the above mentioned DNA duplexes with the various coupling sites, a suggestion is made about the local structure of misincorporation inside the double helix.

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