

# NUCLEIC ACID SOLUTION SULFURIZATION REAGENTS

Proligo® Reagents

## Needs of Phosphorothioates

Many phosphate backbone variants have become popular recently in an attempt to overcome two challenges of the antisense approach to regulating gene expression:

- The delivery of oligonucleotides to the interior of the cell through the highly impermeable barrier of the lipid bilayer that constitutes the cell's membrane.
- The equally important concern about the effective lifetime of the oligonucleotide in the exonuclease-rich environment of the cytoplasm.

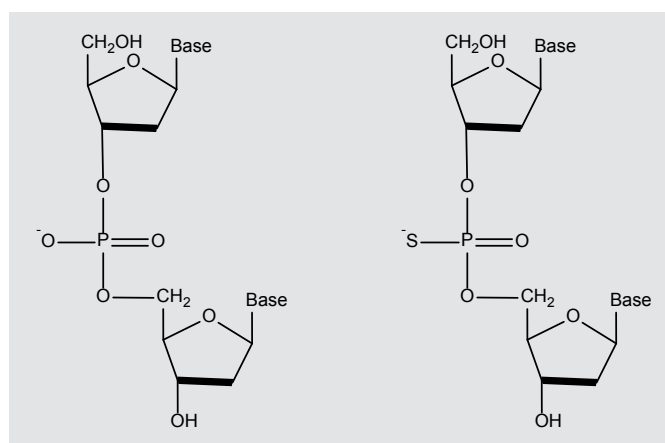
## Synthesis

A variety of reagents have been described in literature. A few of them are listed further below. Some of these reagents found to be superior versus the other but still have challenges during predation, use or stability in solution. The newly introduced Sulfur 42 is combining all advantages and makes it easy to use in your production environment.

## Key Features

- Sulfur 42 is at least 4 times more reactive than Beaucage reagent or PADS
- Crystalline powder
- Odourless, no foul smell
- Solubility in ACN up to 0.28M at (+10 °C); no need to applied a co-solvent like in DCM, THF
- The solvent for the dissolution of the reagent should be dry (< 50 ppm) in order to minimize P=O impurities
- Stable in ACN solution for at least 21 days
- Recommended reaction time for the sulfurization in oligonucleotide synthesis for a 0.1M solution is 60 sec.

## Examples of phosphodiester and phosphorothioate internucleotide linkages

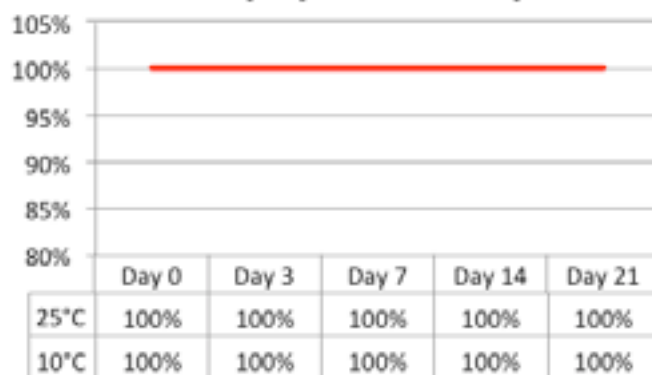


Phosphorothioates (or S-oligos) are a variant of normal DNA in which one of the non-bridging oxygens is replaced by a sulfur. The sulfurization of the internucleotide bond dramatically reduces the action of endo- and exonucleases including 5' to 3' and 3' to 5' DNA POL 1 exonuclease, nucleases S1 and P1, RNases, serum nucleases and snake venom phosphodiesterase. In addition, the potential for crossing the lipid bilayer increases. Because of these important improvements, phosphorothioates have found increasing application in cell regulation.

## Stability Data

- Stability study has been performed at 10 °C and 25 °C for 21 days
- 0.1M and 0.25M solutions have been tested
- No discolouration has been detected
- No deterioration has been observed

### Stability by HPLC Purity



## Reference

1. "1,2,4-Dithiazole-5-ones and 5-thiones as efficient sulfurizing agents of phosphorus(III) compounds - a kinetic comparative study"  
O.Ponomarev, A.P.Laws and J.Hanusek, Org. Biomol. Chem. 2012, 10, 8868

Name	Quantity	Cat. No.
<b>Sulfur 42</b>		
Sulfur 42	1 G	M076000-1G
Sulfur 42	2 G	M076000-2G
<b>Pads</b>		
Phenylacetyl disulfide	25 G	554324-25G

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