

# Handling and Storage of Oligonucleotides

## Oligonucleotides are biomolecules with a limited shelf life!

To gain a maximum shelf life for oligonucleotides, samples should generally be stored dehydrated at  $\leq -15^{\circ}\text{C}$  in absence of light. Under the mentioned conditions, samples are stable for at least 12 months. In case of a longer storage period, oligos should be pretested for molecular integrity prior to experimental use.

The shelf life of oligonucleotides is determined by three main parameters:

### 1. pH sensitivity

Single strand oligos are sensitive to acidic pH values. Therefore the solution media for solving the lyophilised oligonucleotide should be neutral or of low alkalinity (pH 7-9).

### 2. Nuclease degradation

Oligonucleotides can be catabolized by nuclease activity. Nuclease motivated degradation of oligonucleotides is accelerated in the presence of bivalent and/or trivalent cations. To minimize contamination with nucleases, preventive hygiene measures should be taken (wearing laboratory gloves while handling oligos etc.).

### 3. Freeze-thaw effects

The integrity of oligonucleotides can be affected by freeze-thaw processes. To avoid any negative influence on the oligo quality, these procedures should be limited to a minimum. Therefore, we recommend to aliquot the originally delivered stock solution. In case oligonucleotides are delivered as dry material, reconstitute the product in purified water, TE or any biological buffers suitable for your application at a concentration of no less than 100  $\mu\text{M}$  (pH of 7-9, see point 1 above), and produce aliquots. Avoid the use of distilled water, since solution pH may be as low as 4-5.

Recommended further procedure and storage conditions for modified oligonucleotides (especially fluorescent dye labelled oligos): Don't re-lyophilise but store highly concentrated aliquots dark and frozen at  $\leq -15^{\circ}\text{C}$ , thaw them only once, produce working dilutions just before usage and

keep them dark at  $4^{\circ}\text{C}$ . We recommend using up working dilutions within 4 days from the date of preparation. Any unused leftover should be discarded.

### Please note:

- Minimize material's exposure to light because of its bleaching effect.
- The higher the dilution factor, the faster fluorescent activity fades away.
- Diluted working solutions shall be stored refrigerated, not frozen.

## General information on DNA oligonucleotide delivery & documentation

If not ordered otherwise, all custom oligo products are delivered without a 5' (or 3') phosphate group, fully deprotected and ready-to-use. Only Thiol-modified oligonucleotides are supplied in the protected form with the disulfide linkage intact to minimize the potential for oxidation, which results in oligo dimer formation. To use the free thiol (-SH) in your application the disulfide linkage must be reduced.

Appearance of dry oligos may vary from powdery to hyaloid, transparent to off-white/yellowish for unmodified oligos, and respectively colored for dye-labeled oligos. Depending on the amount and density of dried DNA oligonucleotide, solubility and appearance may differ.

Oligos are quantified by measuring their absorbance of ultraviolet light at 260 nm in neutral aqueous solution (Optical Density/OD measurement). Quantity delivered as well as other relevant physical oligo properties are recorded on a comprehensive "Synthesis Report" (Certificate of Analysis) coming along with the products. If HPLC purification or a final QC check by MALDI or ESI-ToF has been ordered, respective chromatograms/Mass spectra are additionally enclosed.