



NittoPhase[®] Solid Support

Polymeric Solid Supports for Oligonucleotide Synthesis

Product Overview

NittoPhase[®] utilizes state-of-the-art polymer synthesis technology to provide a solid support for oligonucleotide synthesis offering high performance at a greatly reduced cost. The superior properties of Kinovate's proprietary cross-linked polystyrene structure provide increased yields with greater purity at lower unit costs. NittoPhase[®] thus delivers a positive impact on both the overall costs and quality of small- to large-scale therapeutic oligonucleotide synthesis.

- **High Loading Capacity**—Robust design enables high loading capacity, delivering synthesis excellent yields
- **Reduced Oligonucleotide Synthesis Costs**—High loading allows greater synthesis scale per column volume, resulting in outstanding per micromole synthesis cost savings.
- **Outstanding Quality**—NittoPhase[®] is manufactured and loaded in compliance with ISO9001:2008 quality management system standards.
- **Diversified Product Offering**—NittoPhase[®] solid supports are available in a variety of loading levels with all standard deoxy and ribo bases, Universal Linker, and a wide range of modified custom linkers.
- **Broad Compatibility with Oligo Synthesizers**—ÄKTA[™] Oligopilot[™], OligoProcess[™], MerMade, ABI and Asahi Kasei (TechniKrom[®])

Properties

NittoPhase[®] Solid Support is available as a fully derivatized support loaded to customer specifications. NittoPhase[®] Solid Support properties are summarized in Table 1.

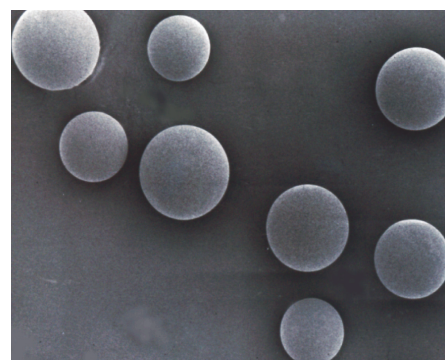


Figure 1. SEM image of NittoPhase[®] Solid Support.

Table 1. NittoPhase[®] Solid Support properties.

Properties	Characteristics
Polymer Matrix	Cross-linked polystyrene
Functionality	Hydroxyl group
# of Hydroxyl Group	420 $\mu\text{mol/g}$
Average Particle Size	90 μm
Average Pore Size	55 nm
Dry Volume	3.2 ml/g
Optimal Loading Capacity	200 $\mu\text{mol/g}$
Swelling Volume (in acetonitrile)	3.85 ml/g
Swelling Volume (in toluene)	6.4 ml/g
Leaching	None

Performance

i) Lab Scale

Table 2. Results of lab scale DNA oligo synthesis with NittoPhase® Solid Support.

NittoPhase® Loading	Sequence	Synthesis Scale (mmol)	Crude Yield (OD ₂₆₀ /μmol)	Purity (%)
UnyLinker™200	DNA 20mer	1	120.0	83.0

Crude Weight Yield (mg/μmol)	Purified Yield (mg/μmol)	P=O (%)	N-1 (%)
7.8	3.6	2.0	2.0

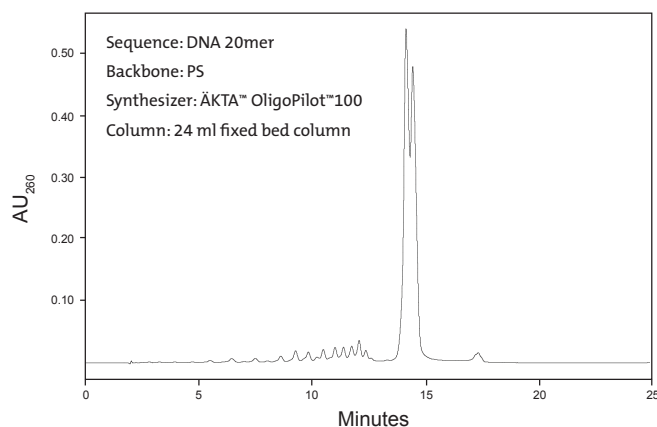


Figure 2. IP-HPLC analysis of crude oligonucleotide.
Sequence: 5'-d[GCC-CAA-GCT-GGC-ATC-CGT-CA]-3'

ii) Commercial Scale*

Table 3. Results of commercial scale DNA oligo synthesis with NittoPhase® Solid Support.

NittoPhase® Loading	Sequence	Synthesis Scale (mmol)	Purity (%)
UnyLinker™200	DNA 20mer	500	85.0

Purified Yield (%) vs Support A †	P=O (%)	N-1 (%)
+5	1.6	0.4

* Data Courtesy of Isis Pharmaceuticals, Inc.

† Comparison with figures derived via parallel test with Support A.

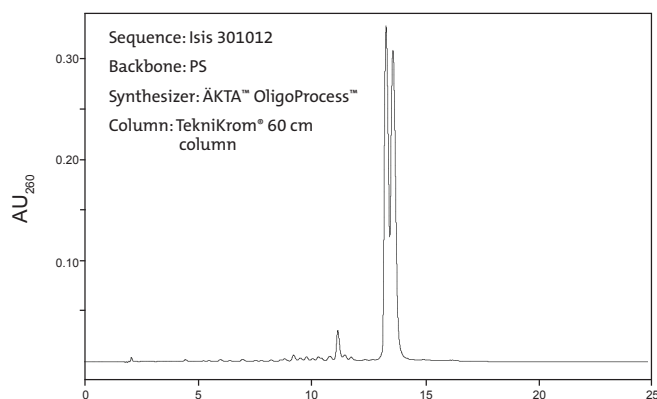


Figure 3. IP-HPLC analysis of crude oligonucleotide.

Product Formats

NittoPhase® Solid Support is available in a variety of formats to meet various oligonucleotide synthesis needs:

- Standard DNA and RNA base loaded supports
- UnyLinker™ loaded universal supports
- Modified linker loaded supports such as 2'-OME, Reverse Abasic, di-DMT-Glycerol, Biotin, etc.
- Custom loaded supports

About Kinovate Life Sciences, Inc.

Founded in 2004, Kinovate Life Sciences, Inc. has established itself as a leader in the field of solid supports for oligonucleotide synthesis. Our manufacturing quality management system has been developed to be fully compliant with ISO9001:2008. Our mission is to deliver the highest quality product at the most competitive price with the best customer service. Our commitment to these values has made us number one partner of choice for the industry's solid support needs.

For more information, please visit www.kinovate.com or contact info@kinovate.com

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COMPANY WITH
QUALITY SYSTEM
CERTIFIED BY DNV
= ISO 9001:2008 =

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LIFE SCIENCES

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