Clarity® BioSolutions for Synthetic DNA/RNA

U.S. Patent No. 7, 119, 145

Clarity QSP™ Cartridges and 96-Well Plates

High-throughput, RPC Purification

- **> 90 % typical purities & recoveries for RNA & DNA**
- **For oligos 10 – 100 mer**
- **Simple 3-step process for trityl-on oligos**
- **Cost-effective solution for high purity**
- **Purification without using ion-pairing agents**

The Quick, Simple, Pure (QSP) Protocol

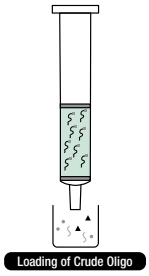
Following the easy, step-by-step QSP protocol anyone can deliver high purity RNA and DNA. The process includes brief sample preparation followed by 3 simple steps to isolate the oligo of interest from impurities and failure sequences. The QSP sorbent and loading buffers have been engineered to work synergistically with crude synthetic mixtures to produce greater than 90 % recoveries and purities in less than 20 minutes.

Pre-treatment: Trityl-on oligo sample preparation. Mix equal volume of loading buffer with cleavage/deprotection solution

STEP 1

Load crude oligo cocktail

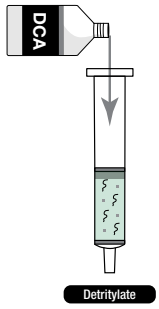
All trityl-off impurities flow directly through; no wash required.



STEP 2

Detritylate

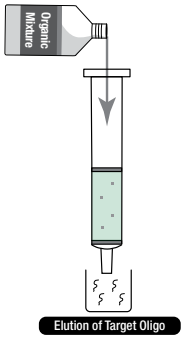
Less than 2 % depurination observed. A faint orange band will appear at top half of cartridge indicating DMT retention.



STEP 3

Elute target oligo

pH buffered solutions used to maintain safe pH for oligo; select elution buffer based on downstream requirements.



Full Length Trityl-On Oligo
Impurity
N-1 Sequence
Detritylated Failure Sequences
Trityl Group
Full Length Target Oligo

Dual-Component System

Two components, loading buffer and SPE cartridge or 96-well plate, are required for Clarity QSP purification. Various loading buffers have been formulated specifically for DNA and RNA chemistries so that one-step loading in synthetic cocktails is permissible and no ion-pairing reagents are required. Multiple SPE formats are available to suit a wide range of synthesis scales and automation requirements. 96-well plates are of a standard footprint and should fit most commercial vacuum manifolds and liquid handling robots.

2008 R&D 100 Award Recipient

Loading Buffers

- DNA: for all DNA and RNA-TOM chemistries
- RNA-TBDMS: for RNA-TBDMS and 2' modified RNA chemistries

SPE Formats

- 60 mg/ 3 mL cartridges: ≤ 200 nmole scale
- 150 mg/ 3 mL cartridges: ≤ 1 µmole scale
- 5 g/ 60 mL cartridges: 5 – 25 µmole scale

- 50 mg/ 96-well plate: 200 nmole scale per well

96-well plate

Negligible Depurination

Significant effort was made during the development of Clarity QSP to minimize the causes of depurination. The lower acid concentrations and limited exposure times within the protocol generate less than 2 % depurination.

Request a FREE copy of Technical Note TN-0008, Avoiding Depurination During Trityl-on Purification for more information.

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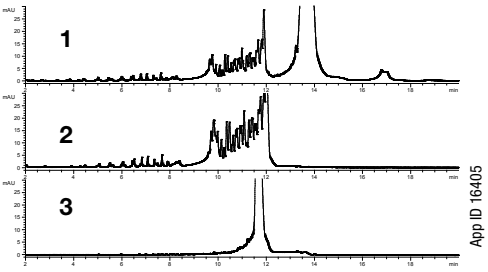
Clarity QSP™ *(cont'd)*

High Purity, High Yield DNA and RNA

Clarity QSP is a next generation trityl-on purification solution that was specifically designed to complement contemporary synthetic processes and consistently deliver high purities and recoveries for all types of synthetic DNA and RNA sequences. Complete discrimination between full-length trityl-on sequences from impurities is guaranteed. The final elution step delivers concentrated, full-length sequences in a stable media suitable for in vivo applications and downstream analysis conducive for MS, NMR, CE, and HPLC.

53nt DNA Purification

Sequence: ACAGTCGTACAGTCATATATTACTATTCAGTGTCTACTGCAGTCGTTATCTAT
Synthesis Scale: 200 nmole
Format: 50 mg / 1 mL



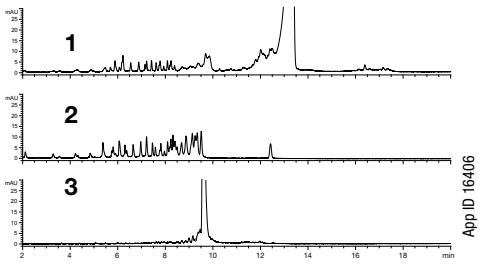
1. Crude Trityl-on
2. Load fraction
3. Detritylated final elution

OD_{260}

Crude Trityl-on	Load Fraction	Detritylated Final Elution	Recovery	Purity (Peak area)
39.7	6.51	29.6	89%	93%

High-Throughput DNA Purification

Sequence: GTGGATCTGCGCACTTCAGGCTCCTGGGCT
Synthesis Scale: 200 nmole
Format: 96-Well Plate (50 mg / well)



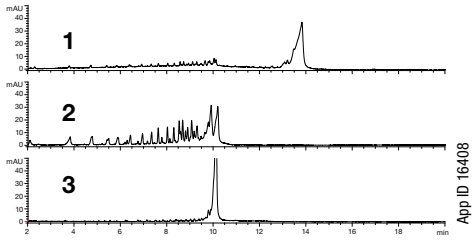
1. Crude Trityl-on
2. Load fraction
3. Detritylated final elution

OD_{260}

Crude Trityl-on	Load Fraction	Detritylated Final Elution	Recovery	Purity (Peak area)
28.3	5.3	20.8	90.3%	92%

Crude 27nt RNA Purification (TBDMS Chemistry)

Sequence: Proprietary
Synthesis Scale: 1 µmole
Format: 150 mg / 3 mL



1. Crude Trityl-on
2. Load fraction
3. Detritylated final elution

OD_{260}

Crude Trityl-on	Load Fraction	Detritylated Final Elution	Recovery	Purity (Peak area)
33.4	9.22	22.9	94%	84%

For more information on the Clarity QSP protocol, depurination, or applications, please request a copy of the Clarity QSP User's Manual.

Ordering Information

Clarity QSP™ Well Plates & Cartridges

Part No.	Description		Unit	Price
Formats				
8E-S102-DGB	Clarity QSP Well Plate	50 mg/well	1/box	
8B-S102-UBJ	Clarity QSP Cartridge	60 mg/3 mL	50/box	
8B-S102-SBJ	Clarity QSP Cartridge	150 mg/3 mL	50/box	
8B-S042-LFF	Clarity QSP Cartridge	5 g/60 mL	16/box	
Buffers*				
AL0-8279	Clarity QSP DNA Loading Buffer	100 mL	ea	
AL0-8280	Clarity QSP DNA Loading Buffer	1 L	ea	
AL0-8281	Clarity QSP RNA-TBDMS Loading Buffer	100 mL	ea	
AL0-8282	Clarity QSP RNA-TBDMS Loading Buffer	1 L	ea	

* RNA-TOM loading buffer available upon request

Request Technical Note TN-0015 Comparing Performance of High-Throughput, Trityl-on RNA/DNA Purification Products to see the benefits of using Clarity QSP over other trityl-on solutions.