Prime Synthesis

Introducing *hyb*CPG

*Hyb*CPG ™ (hybrid CPG) is a new and unique solid synthesis support which combines all the advantages of classic CPG with the loading capacity of polystyrene supports, with no bulk swelling.

- ✓ Highly conformal, thin polymer coating
- ✓ Highly controlled, regular spacing of the reactive sites on the polymer backbone
- ✓ Complete dimensional stability of *Hyb*CPG™ in synthesis solvents
- ✓ Excellent for micro-scale and large scale synthesis
- ✓ Available in a variety of pore sizes and nucleoside loadings
- ✓ Available in Universal Linker formats

Product Overview

Prime Synthesis, Inc. (PSI) is a leading producer of Controlled Pore Glass (CPG) based solid synthesis supports, providing its products to the oligonucleotide (oligo) synthesis market for over two decades. Several years ago, the market asked for a more cost-effective solid support, and the concept of a hybrid support was born. This novel approach combines all of the advantages of classic CPG with the advantages of polystyrene supports. It offers a more highly loaded synthesis support with complete dimensional stability during synthesis. Advanced polymer coating methodology provides an optimized, continuous coating on the rigid CPG skeleton, while maintaining the detailed pore structure of CPG, which is critical to good synthesis performance. Since there is no bulk swelling, complexities of volume changes and backpressure increases during synthesis are eliminated. The chemical structure of the polymer coating is custom designed to give highly controlled regular spacing of the reactive sites along the polymer backbone, resulting in loading capacity increases of 3-4 times that of classic CPG. The result is competitively higher synthesis column loadings with unrivaled synthesis performance in terms of both purity and yield.

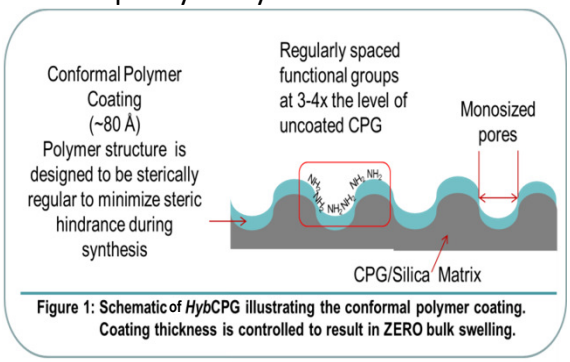

Figure 1: Schematic of *Hyb*CPG illustrating the conformal polymer coating. Coating thickness is controlled to result in ZERO bulk swelling.

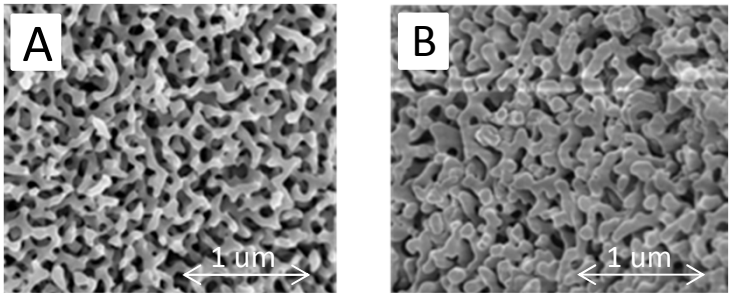

Figure 2: SEM Micrographs of (A) classic uncoated and (B) hybrid coated Controlled Porosity Glass. Pore structure is completely preserved. Images courtesy of NIST.

DNA 20-mer Synthesis on HybCPG

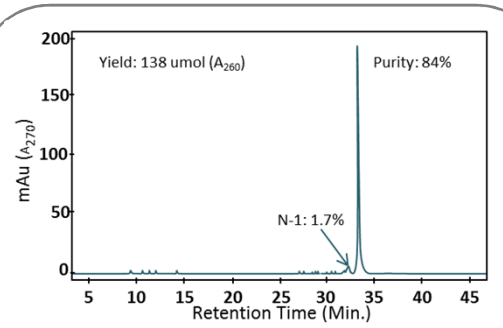

Figure 3: IEX HPLC Chromatogram of 20-mer DNA oligonucleotide using *hyb*CPG of pore size "1" and loading of 150 um/g.

- Synthesizer: AKTA Oligopilot 100 plus
- Synthesis Scale: 238 umoles, 6.3 ml col.
- Sequence: 5' GCA CTT CAG GCT CCT GGG CT -3'
- Amidite Concentration: 0.1 M
- Amidite Excess: 1.5
- Amidite recycle time: 5 minutes
- Bed height limitations: none
- Post synthesis deprotection (6.3 ml col):
  Soak in 1 CV acetonitrile for 5 min
  Add 12 CV 25% ammonium hydroxide
  Incubate 5 Hr. @ 60°C

Guidelines for using *Hyb*CPG™ Solid Synthesis Support

A. Column Packing:

Since it undergoes no bulk swelling during synthesis, *hyb*CPG can be packed anywhere between 90 to 100 % of a fixed-bed column volume, similar to classic CPG. It can also be loaded as a slurry, if desired.

B. Selecting the desired pore size :

It is recommended that a pore size of at least 2x that of classic CPG be used. The recommendations found in "Ordering Information" may also be used

C. Selecting the desired loading:

Follow recommendations found in "Ordering Information"

*Hyb*CPG Ordering Information

Part Number Format: HybCPG-X-YYY-ZZZ

Pore size specification= X

X= 1 (Optimum pore size for short DNA oligo sequences)
X=2 (Optimum pore size for short RNA and mid DNA oligo sequences)
X=3 (Optimum pore size for longer RNA and DNA oligo sequences)
X=4 (Optimum pore size for longest RNA and DNA oligo sequences, or bulky protecting groups)

Loading Range specification= YYY

Y=075 (75umole/g +/- 10%)
Y=100 (100 umole/g +/- 10%)
Y=125 (125 umole/g +/- 10%)
Y=150 (150 umole/g +/- 10%) : Note- for Pore size ranges 1 and 2 only
Y=175 (175 umole/g +/- 10%): Note- for pore size range 1 only

Ligand Chemistry Specification= ZZZ : See Ligand Code Addendum

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Ordering Addendum for Prime Synthesis Solid Supports: Ligand Code

LIGAND	*Protecting Group*	*CODE*
dA	bz	DA
dA	pac	DAP
dC	bz	DC
AcdC	acetyl	ACC
dG	ibu	DG
dG	dmf	DGF
dG	pac	DAG
dT		DT
Inverse dC		IDC
Inverse dT		IDT
Inverse dT	NH-Trityl	NHT
Abasic		AB
2'OMe rA	bz	OMA
2'OMe rC	bz	OMC
2'OMe rC	acetyl	MCA
2'OMe rG	ibu	OMG
2'OMe rA	pac	MRA
2'OMe rC	pac	MRC
2'OMe rG	pac	MRG
2'OMe rU		MRU
rA	TBDMS, bz	RA
rA	bz	RAB
AcrA	acetyl	ARA
rC	TBDMS, acetyl	RC
rC	TBDMS,bz	RCB
rG	TBDMS, ibu	RG
rG	ibu	RGI
rG	pac, TBDMS	RGP

Ordering Addendum for Prime Synthesis Solid Supports: Ligand Code

LIGAND	*Protecting Group*	*CODE*
rU	TBDMS	RU
Deoxy U-5-Fluoro		CUS
Dabcyl		DAB
2’ Fluoro Cytidine	acetyl	FC
2’ Fluoro Uridine		FU
2’ Fluoro A		FA
2’ Fluoro G		FG
C6-Disulfide		C6
C6-Amino modifier		C6A
C7-Amino modifier		C7A
L-rG	ibu	LRG
L-rC	acetyl, TBDMS	LRC
L-rA	bz	LRA
Bis-DMT Glycerol		BG
Ribo Inosine	TBDMS	RI
rG	dmf	RGF
3’Cholesterol TEG		CHO
Locked A	bz	LNA-A
Locked C	bz	LNA-C
Locked G	dmf	LNA-G
Locked T		LNA-T
2’ Acetyl rA	bz	ACRA
2’ Acetyl rC	acetyl	AACR
2’ Acetyl rG	ibu	ARG
2’ Acetyl rU		ARU
Phthalamido C-6 Amino modifier		PH
3’ Thiol Modifier C-3		TM