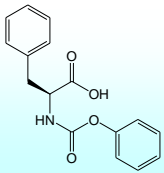
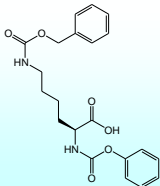
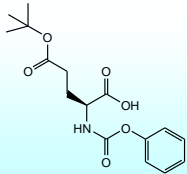
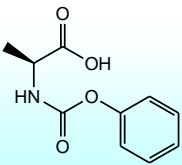


New Monomers for Polypeptides Synthesis (Prototype)

Amino acid-NPC (N-phenoxy carbonyl)

- Stable than NCA
- Direct Polymerization
- Halogen Free (Phosgene Free)

- ※ **High storage stability** (more than 3 months in 4°C and dry)
- ※ Can be polymerized with keeping **“Living”** and **“optical activity”**
- ※ Also can be used for **synthesis of NCA without phosgene**

Code	Product Name [CAS RN®]	Structure	Purity [%]	mp [°C]	Price for 1g
L00402	Phe-NPC [56379-89-6]		>98	98.9	\$110
L00401	Lys(Z)-NPC [1387552-55-7]		>98	117.5	\$110
L00396	Glu(OtBu)-NPC [503560-71-2]		>98	111.2	\$155
L00394	Ala-NPC [141695-27-4]		>98	122.2	\$110

Manufacturer of Products

JSR Life Sciences Co.

JSR Life Sciences JSR
MATERIALS INNOVATION

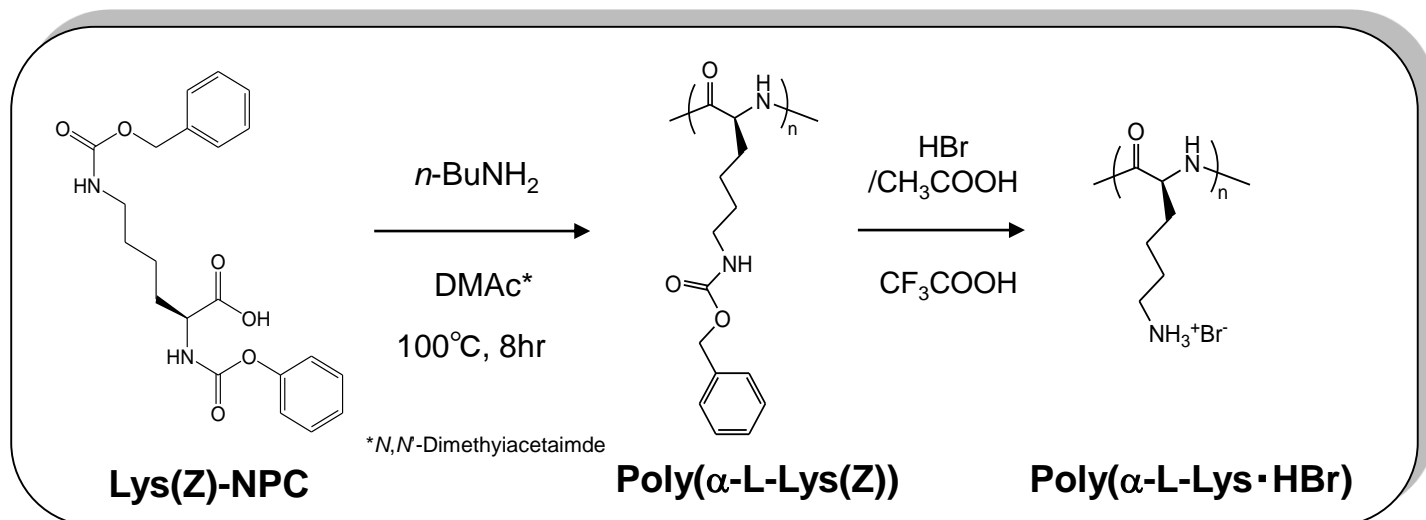
Contact info for inquiries

 **WATANABE Chemical Industries, Ltd.**

2-2-5, Sakaimachi, Naka-ku, Hiroshima
730-0853 JAPAN

TEL:+81-82-231-0540 FAX:+81-82-231-1451
<https://www.watanabechem.co.jp/en/>
E-mail: sales@watanabechem.co.jp

Use Case 1: Direct Synthesis of Polypeptides



Polypeptides are —

- ✓ prepared from heating NPC with amines as initiator
- ✓ reprecipitated by diethyl ether

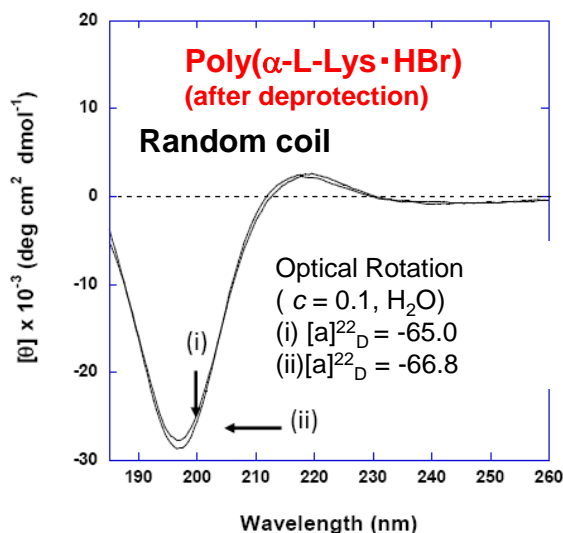
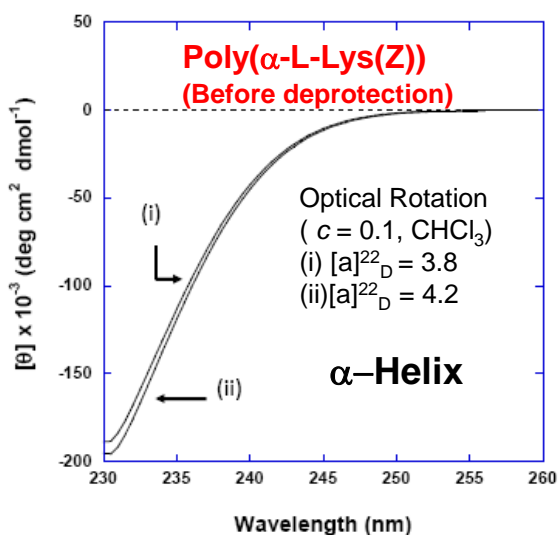
• Data of Molecular weight

Monomer	Conc. [mol/L]	Amine [mol%]	M/I	Conv. [%]	Yield [%]	M_n	M_w/M_n
Lys(Z)-NPC	0.5	1	100	>99	81	31,288	1.24
Lys(Z)-NPC	0.5	2	50	>99	72	16,567	1.23
Lys(Z)-NPC	0.5	4	25	>99	80	7,354	1.73
Lys(Z)-NPC	0.5	8	12.5	>99	93	4,147	2.02

Estimated by SEC: DMF solution with 10mM LiBr

• Data of CD Spectra (vs NCA)

- (i) Prepared from NPC
- (ii) Prepared from NCA



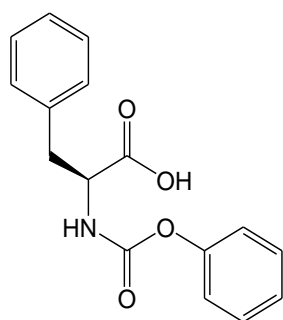
Reference : Yamada, S.; Koga, K.; Endo, T. *J. Polym. Sci. Part A: Polym. Chem.* **2012**, in press
 Yamada, S.; Koga, K.; Endo, T., Kinki univ., Syntheses of Polypeptides by Polycondensation of Urethane Derivatives of Amino Acids, 61st SPSJ Annual Meeting, PACIFICO YOKOHAMA, May 29th, 2012

- ✓ Polymerization is 'NOT' inhibited by phenol (by-product)
- ✓ Well-defined polypeptides are obtained without any racemization

↓

Polymerized with keeping "Living" and "optical activity"
Phosgene free, no need to recrystallize monomer before use

Use Case 2: Synthesis of NCAs (Phosgene free)

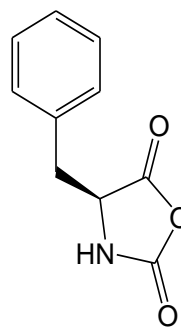


Phe-NPC

NPC Conc.=0.043M
Oleic acid 1eq.
or
Acetic acid 3eq.

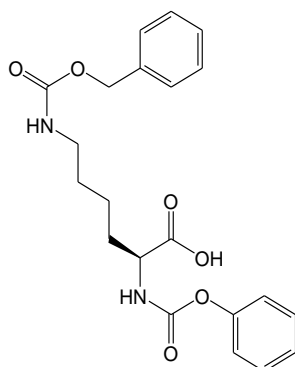
MIBK*
96°C, 8hr

*Methyl isobutylketone



Phe-NCA

Conv. : 90%
Yield : 60%

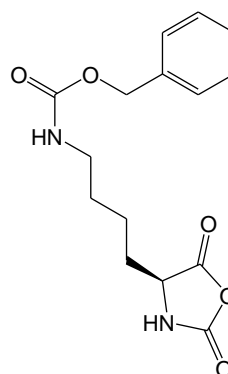


Lys(Z)-NPC

NPC Conc.= 0.1M
Acetic acid 3eq.

MEK*
80°C, 24hr

*Methyl ethylketone



Lys(Z)-NCA

Conv. : >99%
Yield : 50%

Reference: Yamada, S.; Koga, K.; Endo, T., Kinki univ., Syntheses of Polypeptides by Polycondensation of Urethane Derivatives of Amino Acids, 61st SPSJ Annual Meeting, PACIFICO YOKOHAMA, May 29th, 2012

NCAs are —

- ✓ prepared from heating NPC in the presence of organic acids
- ✓ crystallized by n-Hexane or diethyl ether (and so on)

NCA with high reactivity can be prepared through a single crystallization step

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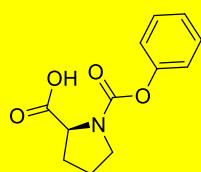
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 **WATANABE Chemical
Industries, Ltd.**

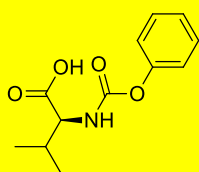
2-2-5, Sakaimachi, Naka-ku, Hiroshima
730-0853 JAPAN
TEL:+81-82-231-0540 FAX:+81-82-231-1451
<https://www.watanabechem.co.jp/en/>
E-mail: sales@watanabechem.co.jp

Amino acid NPC Variation (Prototype List)

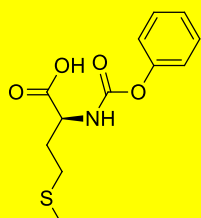
Hydrophobic Amino acid



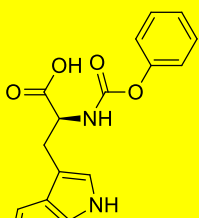
Pro-NPC



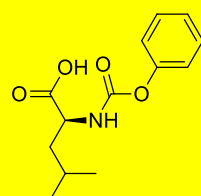
Val-NPC



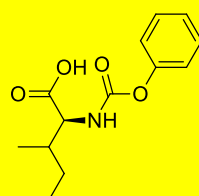
Met-NPC



Trp-NPC



Leu-NPC

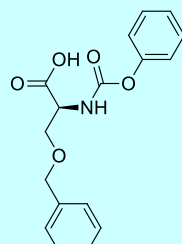


Ile-NPC

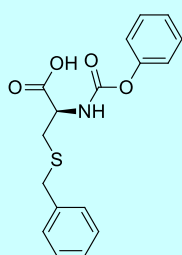
Hydrophilic Amino acid



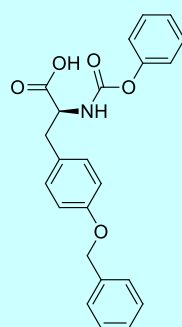
Thr(Bzl)-NPC



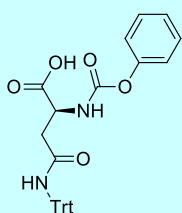
Ser(Bzl)-NPC



Cys(Bzl)-NPC

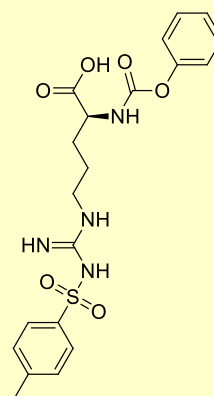


Tyr(Bzl)-NPC

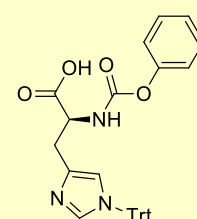


Asn(Trt)-NPC

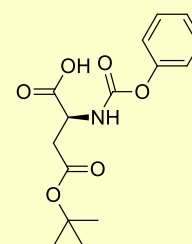
Acidic and Basic Amino acid



Arg(Ts)-NPC

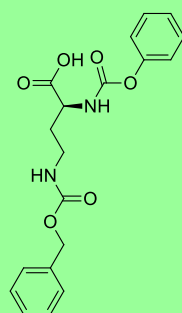


His(Trt)-NPC

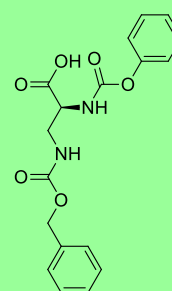


Asp(tBu)-NPC

Amino acid analogue



Dab(Z)-NPC



Dap(Z)-NPC

Etc.

Please contact us with further information of these prototype products

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