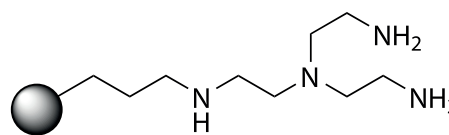


Biotage® MP-Trisamine

Electrophile Scavenger



Key Facts



Shelf Life

Capacity
(mmol/g)

BSE/TSE



Scalable

Particle Size
(μm)Thermally &
Mechanically
StableGood
Laboratory
PracticeBulk Density
(g/L)

Specifications

Chemical Name:	Tris-(2-aminoethyl)aminomethyl polystyrene
Resin Type:	Highly cross-linked Macroporous poly(styrene-codivinylbenzene)
Application:	Scavenging acid chlorides, sulfonyl chlorides, isocyanates, and other electrophiles
Typical Scavenging Conditions:	3–6 equivalents relative to acid chloride, 1–4 h, 20 °C.
Compatible Solvents:	Non-acidic organic solvents and water.
Swelling:	DCM (3.9 mL/g), DMF (<4.5 mL/g), THF (3.7 mL/g), MeOH (3.8 mL/g), water (4.0 mL/g)
Storage:	Cool, dry location

Biotage supplies two bound trisamines. Biotage® Si-Trisamine is a powerful metal scavenger for transition metals such as Palladium, copper, zinc and iron. (see product note PPS372) MP-Trisamine is a macroporous polystyrene-bound scavenger, for electrophiles such as acid chlorides, sulfonyl chlorides, and isocyanates. Resin-bound scavengers are added after a reaction is complete in order to quench and react selectively with excess reactants and/or reaction by-products.

Biotage® MP-Trisamine is a highly cross-linked, robust, and low-swelling material, which makes it ideal for restricted volume environments (e.g. microwave vials, 96-well plates, etc.). Its unique pore structure provides greater access to the

reactive sites without the need for solvent swelling, resulting in faster reactions and higher recoveries. The abrasion-resistant matrix has better handling characteristics and reduced transfer losses.

Representative Procedures

Scavenging by MP-Trisamine and PS-Trisamine in 1,2-Dichloroethane

The scavenging capability of MP-Trisamine was tested with a series of five electrophiles, present at an initial concentration of 0.5 M in dichloroethane (Table 1). Under these conditions, four of the five electrophiles were scavenged within 0.5 h, using either of the two scavengers. PS-Trisamine was unable to scavenge 3-methoxyphenyl isocyanate to completion in this time.

The Effect of Different Solvents on Scavenging by MP-Trisamine and PS-Trisamine

Scavenging in THF, which swells 1% cross-linked polystyrene, was compared with scavenging in acetonitrile and methyl tert-butyl ether (MTBE). Acetonitrile and MTBE are poor solvents for swelling 1% cross-linked polystyrene. MTBE was chosen as a model for other ethereal solvents commonly employed in organic synthesis. The results are shown in Table 2. MP-Trisamine scavenged effectively in all three solvents, capturing both substrates to 89–100% within 0.8 h. PS-Trisamine also scavenged 4-chlorobenzoyl chloride effectively in THF and acetonitrile, but these reactions occurred more slowly than with MP-Trisamine.

MP-Trisamine also scavenged 3-methoxyphenyl isocyanate in acetonitrile additionally, in MTBE, MP-Trisamine sequestered both electrophiles to completion within 4 h, in this traditionally PS-gel non-swelling solvent.

Electrophile	Resin	Equivalents	% Scavenged in 0.5 h
4-chlorobenzoyl chloride	PS-Trisamine	3.5	100
	MP-Trisamine	3.5	100
2-phenylbutyryl chloride	PS-Trisamine	3.5	100
	MP-Trisamine	3.5	100
2,6-dimethoxybenzoyl chloride	PS-Trisamine	3.5	100
	MP-Trisamine	3.5	100
3-methoxyphenyl isocyanate	PS-Trisamine	3.0	92
	MP-Trisamine	3.0	100
Benzene sulfonyl chloride	PS-Trisamine	4	100
	MP-Trisamine	4	100

Table 1. Comparative scavenging of electrophiles by PS-Trisamine or MP-Trisamine in 1,2-dichloroethane at room temperature.

Electrophile	Solvent	Time (h)	MP-Trisamine % Scavenged
4-chlorobenzoyl chloride	THF	0.5	100
		2	100
	Acetonitrile	0.7	100
		1.8	100
		5.3	
		20	
	MTBE	0.8	100
		3.8	100
20			
3-methoxyphenyl isocyanate	THF	0.5	89
		2	89
		4 days	89
	Acetonitrile	0.7	90
		1.8	90
		5.3	90
		20	100
		3.8	100
	MTBE	0.8	95
		3.8	100

Table 2. Comparative scavenging of electrophiles by 3 equivalents of MP-Trisamine in different solvents at room temperature.

Summary

MP-Trisamine offers the following benefits:

- » Scavenges effectively in solvents that do not swell regular gel type cross-linked polystyrene
- » Limited swelling, so can be used where volume is restricted (e.g. 96 well plates, microwave vials)
- » For certain substrates, Biotage® MP-Trisamine offers more complete scavenging than does gel base Trisamine

Ordering Information

Part Number	Quantity
801505	3 g
801397	10 g
801398	25 g
801399	100 g
801400	1000 g

EUROPE

Main Office: +46 18 565900
 Fax: +46 18 591922
 Order Tel: +46 18 565710
 Order Fax: +46 18 565705
 order@biotage.com
 Support Tel: +46 18 56 59 11
 Support Fax: + 46 18 56 57 11
 eu-1-pointsupport@biotage.com

NORTH & LATIN AMERICA

Main Office: +1 704 654 4900
 Toll Free: +1 800 446 4752
 Fax: +1 704 654 4917
 Order Tel: +1 800 446 4752
 Order Fax: +1 704 654 4917
 ordermailbox@biotage.com
 Support Tel: +1 800 446 4752
 us-1-pointsupport@biotage.com

JAPAN

Tel: +81 3 5627 3123
 Fax: +81 3 5627 3121
 jp_order@biotage.com
 jp-1-pointsupport@biotage.com

CHINA

Tel: +86 21 68162810
 Fax: +86 21 68162829
 cn_order@biotage.com
 cn-1-pointsupport@biotage.com

KOREA

Tel: +82 31 706 8500
 Fax: +82 31 706 8510
 korea_info@biotage.com
 kr-1-pointsupport@biotage.com

INDIA

Tel: +91 11 45653772
 india@biotage.com

Distributors in other regions
 are listed on www.biotage.com

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