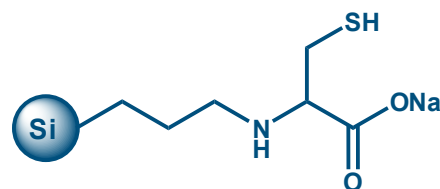


# New SiliaBond Metal Scavenger SiliaBond Cysteine

## Specifications

<b>Product Name:</b>	SiliaBond Cysteine
<b>Product Number:</b>	R80530B
<b>Molecular Loading:</b>	> 0.3 mmol/g
<b>Silica Characteristics:</b>	40-63 $\mu\text{m}$ , 60 Å Tan powder
<b>Solvent Compatibility:</b>	All solvents, aqueous and organic
<b>Prolonged Storage:</b>	Keep dry under argon
<b>Typical Exp. Procedure</b>	Refer you to "Appl. Note M1.0 - Typical Exp. Conditions"



## Typical Applications:

### Efficient Metal Scavenger for:

- Tin
- Palladium
- Ruthenium
- Platinum
- Copper
- Rhodium
- Cadmium
- Scandium

## Description of SiliaBond Cysteine

**SiliaBond Cysteine** is the silica bound equivalent of the amino acid Cysteine. By attaching the molecule to the backbone via the amino group, the thiol group remains free and accessible for higher metal scavenging efficiency. It is a versatile metal scavenger for a variety of metals including Pd, Sn, Ru, Pt, Cu, Rh, Cd and Sc under a wide range of conditions and the preferred metal scavenger for tin residues.

Cysteine has been reported to efficiently remove palladium and heavy metals in aqueous solutions but its limited solubility in organic solvent can limit its range of applications. By using **SiliaBond Cysteine**, solubility issues can be solved and almost all solvents can now be used.

1. a) W098/51646; b) US 2006/0091067 A1

## Ordering Information

For your convenience, SiliCycle offers **SiliaBond Cysteine** in various formats.

Contact us for more information!

\*SiliaBond Cysteine is also available in SiliaPrep™ SPE & Well Plates and SiliaSep™ Flash Cartridges formats. Contact us!

### SiliaBond Cysteine Formats\*

Formats	
10 g	1 kg
25 g	5 kg
100 g	10 kg
500 g	25 kg*

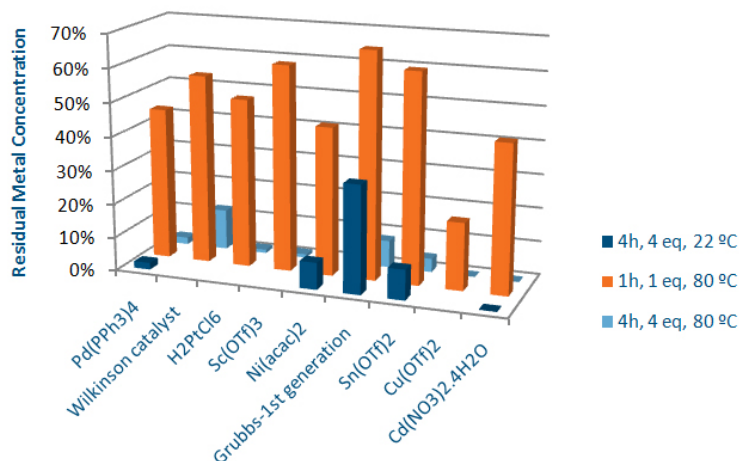


\* This product is also available in larger quantity (multi-ton scale). Contact us!

## Efficient Metal Removal Using SiliaBond Cysteine

A metal scavenging study using SiliaBond Cysteine was conducted on various metal catalysts commonly used in organic synthesis to examine its effectiveness. Various parameters were studied for their influence on the scavenger robustness as well as to establish the best conditions to bring the level of metal down to an acceptable level for the pharmaceutical industry (i.e.: solvent, number of equivalents, temperature, reaction time, and nature of the catalyst).

### SCAVENGING VARIOUS METAL CATALYSTS



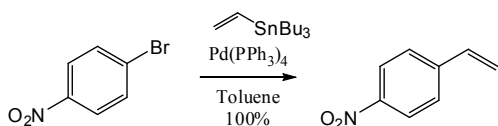
#### % of metal captation

Conditions	Pd(PPh <sub>3</sub> ) <sub>4</sub>	Wilkinson	H <sub>2</sub> PtCl <sub>6</sub>	Sc(OTf) <sub>3</sub>	Ni(acac) <sub>2</sub>	Grubbs (1st Generation)	Sn(OTf) <sub>2</sub>	Cu(OTf) <sub>2</sub>	Cd(NO <sub>3</sub> ) <sub>2</sub> .4H <sub>2</sub> O
4eq., 4h, 22 °C	98%	-	-	-	92%	68%	91%	-	100%
1eq., 1h, 80 °C	55%	44%	50%	39%	56%	33%	38%	80%	56%
4eq., 4h, 80 °C	98%	88%	99%	99%	-	92%	96%	100%	100%

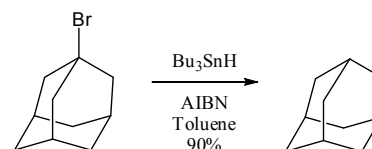
Initial concentration: 1 000 ppm in DMF except for Pd(PPh<sub>3</sub>)<sub>4</sub>, Cadmium and Wilkinson's catalysts that is 500 ppm.

### SCAVENGING TIN RESIDUES

#### STILLE COUPLING



#### RADICAL REDUCTION



#### % of Tin captation

Conditions	SiliaBond Cysteine	SiliaBond TAAcONa	SiliaBond Triamine
4eq., 4h, 22 °C	64%	60%	24%
4eq., 4h, 80 °C	64%	76%	16%
8eq., 4h, 80 °C	64%	62%	20%
4eq., 4h, 22 °C (2 consecutive treatments)	99%	96%	42%

Initial concentration: 3385 ppm.

#### % of Tin captation

Conditions	SiliaBond Cysteine	SiliaBond TAAcONa	SiliaBond Triamine
4eq., 4h, 22 °C	56%	66%	0%
4eq., 4h, 80 °C	74%	72%	0%
8eq., 4h, 80 °C	88%	90%	0%
4eq., 4h, 22 °C (2 consecutive treatments)	92%	90%	0%

Initial concentration: 4090 ppm.