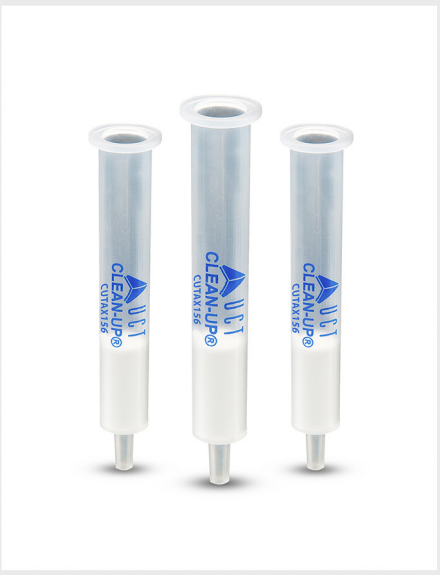
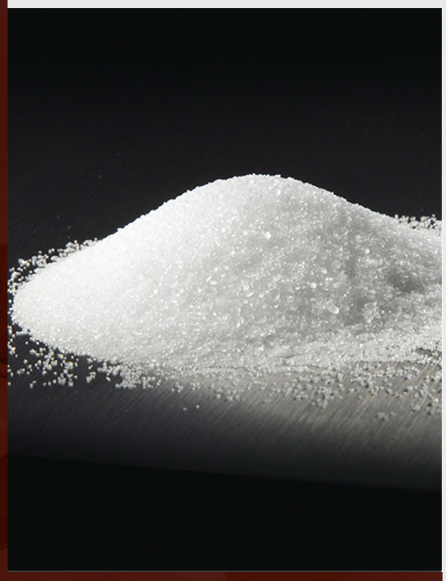
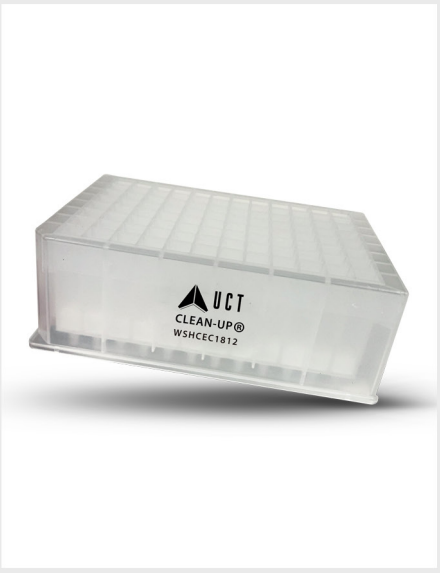
CLEAN-UP®
PURIFICATION TECHNOLOGIES

SILICA-BASED METAL SCAVENGERS & FUNCTIONALIZED SILICA SORBENTS







UNITED CHEMICAL TECHNOLOGIES
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UCT

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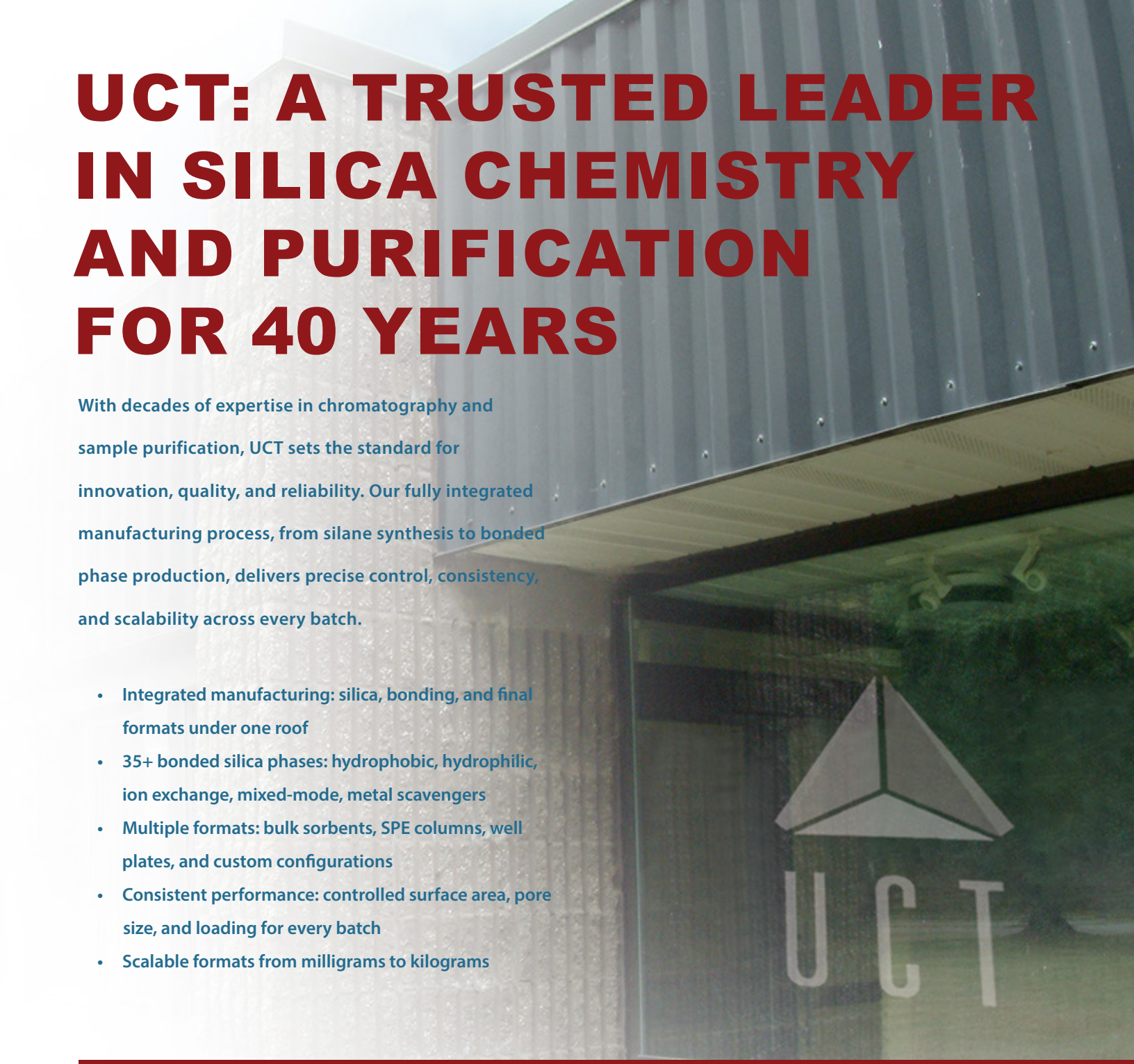
UCT: A TRUSTED LEADER IN SILICA CHEMISTRY AND PURIFICATION FOR 40 YEARS

With decades of expertise in chromatography and sample purification, UCT sets the standard for innovation, quality, and reliability. Our fully integrated manufacturing process, from silane synthesis to bonded phase production, delivers precise control, consistency, and scalability across every batch.

- Integrated manufacturing: silica, bonding, and final formats under one roof
- 35+ bonded silica phases: hydrophobic, hydrophilic, ion exchange, mixed-mode, metal scavengers
- Multiple formats: bulk sorbents, SPE columns, well plates, and custom configurations
- Consistent performance: controlled surface area, pore size, and loading for every batch
- Scalable formats from milligrams to kilograms



"PURITY IS THE FOUNDATION OF EVERYTHING WE CREATE"

UCT

Quality Management ISO 9001:2015 DEKRA Certified

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A COMPLETE PURIFICATION SYSTEM

Modern chemistry and analytical science depend on sophisticated catalytic reactions, complex formulations, and challenging matrices. Such processes also introduce persistent purification challenges:

- **Residual metals (Pd, Cu, Ni, Ru, Rh, Ag, Fe, etc.)**
- **Ligands, byproducts, and excess reagents**
- **Matrix components such as lipids, salts, proteins, or debris**
- **Analytical interferences in LC/GC/MS workflows**

UCT addresses these challenges through the **Clean-Up®** purification portfolio, comprising:

- **Silica-based metal scavengers - designed to capture and remove catalytic metals**
- **Silica-based SPE sorbents - designed to remove matrices, organic impurities, and ionic interferences**

Since both technologies are engineered on the same UCT-manufactured silica platform, they work together effortlessly within a single purification workflow. Together, they form a complete silica purification ecosystem that supports discovery chemistry, reaction cleanup, sample prep, and large-scale manufacturing.

UCT QUALITY & MANUFACTURING CONTROL

UCT controls the entire process from silane synthesis and silica activation to bonding and final packaging. This allows tight control over:

- **Surface area and pore structure**
- **Functional loading level**
- **Particle size distribution**
- **Batch-to-batch reproducibility**

Each lot is released only after it meets predefined specifications. Every batch of Clean-Up® sorbent is accompanied by a Certificate of Analysis (CoA) that typically includes:

- **Surface area (BET multipoint)**
- **Pore diameter (nitrogen adsorption)**
- **Pore volume (nitrogen adsorption)**
- **Particle size distribution (laser diffraction / multisizer)**
- **Functional loading (elemental analysis)**
- **Appearance and identity**
- **Shelf-life under controlled storage**

This depth of characterization supports regulatory compliance, requalification and process robustness.

WHY ARE METAL SCAVENGERS ESSENTIAL?

Catalytic methods such as Suzuki Coupling, Buchwald–Hartwig Amination, Heck, Sonogashira, Olefin Metathesis, and Knoevenagel Condensation may leave behind trace metals.

Residual metals can:

- **Compromise API quality**
- **Interfere with downstream purification**
- **Delay regulatory approval (ICH Q3D, FDA, EMA)**
- **Lower yield and throughput**
- **Damage analytical instrumentation**

Clean-Up® metal scavengers provide a fast, selective, and scalable solution to meet the regulatory standards in both research and manufacturing environments.

APPLICATIONS ACROSS INDUSTRIES

Pharmaceutical Manufacturing & API Synthesis:

Removes toxic metal contaminants, meet regulatory compliance, and produce high-quality APIs.

Fine & Specialty Chemicals Production:

Enhances purity, minimizes contamination, and improves production efficiency.

Analytical & Medicinal Chemistry (HPLC/Prep-HPLC):

Protects valuable columns and instrumentation while delivering reliable results by removing metal impurities during clinical studies or final purification.

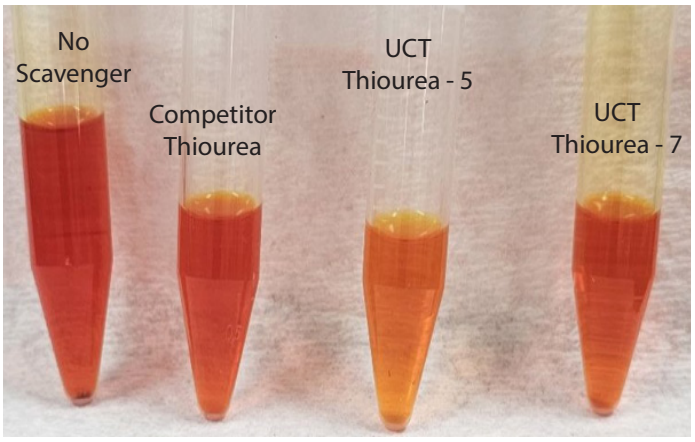
TYPICAL REACTION CLASSES AND SUGGESTED SCAVENGERS

Reaction	Residual Metal	Recommended Scavenger
Suzuki Coupling	Pd	Silica Thiol
Buchwald–Hartwig	Pd, Cu	Thiol / Thiourea
Heck Reaction	Pd	Silica Thiol
Sonogashira	Pd, Cu	Thiol / Thiourea
Olefin Metathesis	Ru	Silica Thiol
Knoevenagel	Zn, Fe	Silica Thiol

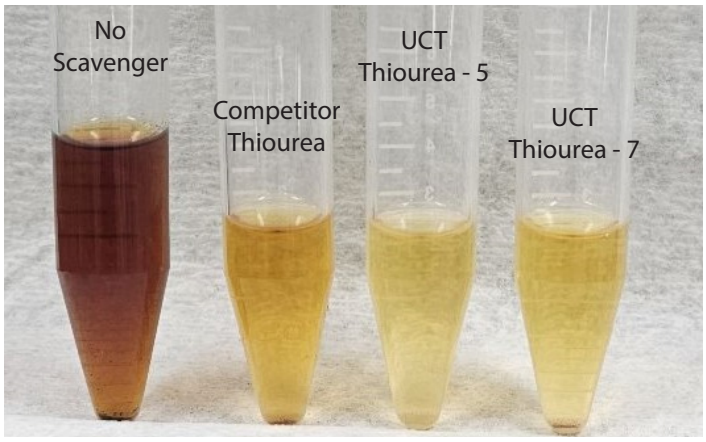
Performance Advantages of UCT's Silica-Based Metal Scavengers	
Feature	**Benefit**
No Leaching	Metal–silica bonds are fully anchored, preventing any contamination of APIs or filtrates.
Stringent Purity Control	Every batch is rigorously tested to ensure clean, defect-free, and consistent performance.
Targeted Selectivity	Functionalized groups capture metals precisely while preserving complete API recovery.
Broad Metal Affinity	Efficiently removes diverse metals and oxidation states from catalytic residues.
Rapid Kinetics	Fast metal binding at ambient temperature minimizes process time and boosts productivity.
Process Efficiency	Reduces solvent use and cycle time, offering lower cost per gram of metal removed.
Universal Solvent Compatibility	Performs seamlessly in both aqueous (pH 2–12) and organic systems.
Flow & Microwave Ready	Fully compatible with modern synthesis and purification platforms.
Exceptional Stability	Maintains structure under high heat and mechanical agitation without swelling or deformation.
Simple & Scalable Workflow	Add, stir, filter. Easily scalable from R&D to manufacturing scale.
Consistent Loading	Precisely controlled loading levels allow predictable stoichiometry and performance.
Reliable Supply	Large-scale production ensures immediate availability and secure supply chain.

A visual comparison of Rh and Ru catalyst scavenging, where CUTHU-5 and CUTHU-7 represent two different loadings.

Ruthenium Catalyst Scavenging



Rhodium Catalyst Scavenging



Solutions of Rh and Ru catalysts were prepared in organic solvents and treated with 2.5 mmol equivalents of CLEAN-UP® Thiourea (THU). After 24 hours of mixing on a nutating mixer, samples were analyzed by ICP-OES to determine metal removal efficiency. Both sorbents demonstrated better metal scavenging performance compared to the competitor product.

CLEAN-UP® METAL SCAVENGERS PORTFOLIO OVERVIEW

UCT offers a complete set of silica-based metal scavengers, each engineered with a specific ligand, metal preference, and coordination behavior. Built on high-purity silica with controlled loading and pore architecture, these chemistries provide fast, selective, and scalable removal of catalytic metals across a wide range of reaction types and solvent systems.

Silica Thiopropyl (Thiol) - Broad-Spectrum Metal Capture

Ligand: 3-mercaptopropyl (–SH)
Affinity: Pd, Ru, Rh, Ir, Cu, Ag, Hg, Os, Sn
Mechanism: Soft sulfur donor binds strongly to soft and late-transition metals, forming stable metal–thiolate complexes.

Advantages:

- Universal scavenger suitable for mixed or unknown metal residues
- Fast kinetics under mild conditions
- Effective in many organic solvents
- Reliable first-line choice for screening and process development

Silica Thiourea - High Selectivity for Palladium

Ligand: Thiourea (S/N bidentate functionality)
Affinity: Pd(0/II), Rh, Os, Sn, Fe
Mechanism: Metals coordinate simultaneously with sulfur and nitrogen donors, enabling strong chelation of palladium species, including ligand-stabilized complexes.

Advantages:

- Exceptional Pd affinity
- Ideal for coupling reactions requiring very low final Pd limits
- API-compatible conditions with minimal risk of overbinding
- Effective against a variety of Pd oxidation states

Silica Triamine - High-Density Chelation

Ligand: Multi-amine functionality (three nitrogen donors)
Affinity: Pd, Pt, Rh, Os, and other coordination-prone metals
Mechanism: Multiple nitrogen donors form multidentate complexes, increasing chelation strength and stability, especially for metals with open coordination sites.

Advantages:

- Higher chelating capacity than simple amine sorbents
- Suitable for demanding metal profiles
- Effective in broad solvent systems
- Useful when enhanced metal "pull-down" is required

Silica Diamine (PSA) - Dual Metal and Acid Interaction

Ligand: Primary/secondary diamine (–NH–CH_2–CH_2–NH_2)
Affinity: Pd, Rh, Re, Zn, Cr, Ru
Mechanism: Nitrogen donors coordinate to metal centers while the amine network also interacts with acidic by-products, offering dual-function cleanup.

Advantages:

- Removes metals and acidic impurities in a single step
- Broad applicability across solvents
- Valuable when crude mixtures contain multiple impurity classes
- Ideal for early-route screening and robustness tests

Silica DMT (Sulfur-Rich) - For Stubborn Soft Metals

Ligand: Sulfur-rich heterocyclic (multi-S donor)
Affinity: Pd, Hg, Ag, and difficult soft-metal residues
Mechanism: Multiple sulfur atoms create a high-density coordination environment ideal for capturing soft metals resistant to conventional scavengers.

Advantages:

- Enhanced selectivity for challenging metal contaminants
- Effective for heavily ligated or trace-level soft metals
- Useful as a second-pass scavenger when thiol/thiourea is insufficient
- Operates under mild, product-friendly conditions

Silica Triacetic Acid (Carboxylate) - Hard-Metal Remover

Ligand: Polycarboxylate / triacetic acid functionality
Affinity: Co, Ni, Mg, Zn, lanthanides, and other hard metal cations
Mechanism: Oxygen donors from carboxylate groups form stable complexes with hard Lewis-acidic metals, efficiently removing metal salts and inorganic residues.

Advantages:

- Ideal for base-metal or lanthanide impurities
- Works in aqueous and polar solvent environments
- Complements sulfur- and amine-based scavengers
- Useful in reactions involving metal bases, salts, or inorganic residues

METAL SCAVENGERS SELECTION GUIDE

Extraction Phases

Sorbent	Surface Area	Avg. Pore Size	Pore Volume	Molecular Loading	Metals Scavenged
Thiopropyl	470-530 m^2/g	55 - 65Å	0.70-0.85 cm^3/g	≥1.3 mmol/g	**Higher Affinity** Ag, Hg, Os, Pd, Ru **Moderate Affinity** Cu, Ir, Pb, Rh, Sn, Se
Thiourea	470-530 m^2/g	55 - 65Å	0.70-0.85 cm^3/g	≥1.0 mmol/g	**Higher Affinity** Pd, Ru **Moderate Affinity** Ag, Cu, Fe, Os, Rh, Sc, Sn
Triamine	470-530 m^2/g	55 - 65Å	0.70-0.85 cm^3/g	≥0.7 mmol/g	**Higher Affinity** Cr, Pd, Pt, W, Zn **Moderate Affinity** Ag, Cd, Co, Cu, Fe, Hg, Ni, Os, Pb, Rh, Ru, Sc, Se
PSA	470-530 m^2/g	55 - 65Å	0.70-0.85 cm^3/g	≥0.7 mmol/g	**Higher Affinity** Cr, Pd, Pt, W, Zn **Moderate Affinity** Cd, Co, Cu, Fe, Hg, Ni, Pb, Ru, Se, Sc, V
Triacetic Acid	470-530 m^2/g	55 - 65Å	0.70-0.85 cm^3/g	N/A	**Higher Affinity** Ca, Co, Ir, Li, Mg, Ni, Os, Ru, Sc, Sn **Moderate Affinity** Cr, Cs, Fe, Pd, Rh

INTEGRATED WORKFLOWS COMBINING METAL SCAVENGERS AND SPE

UCT's Clean-Up® metal scavengers and SPE sorbents are designed to function seamlessly within the same purification sequence. Whether you are working in synthetic chemistry, analytical laboratories, or manufacturing environments, these tools can be combined to deliver efficient, scalable, and reproducible purification.

Synthetic Chemistry Workflow

1. Metal Scavenging
Treat the crude mixture with the selected Clean-Up® metal scavenger (Silica Thiol, Thiourea, Triamine, PSA, etc.) to capture catalytic metals.

2. Filtration and Rinse
Remove the scavenger by filtration and rinse the solid bed to maximize product recovery.

3. SPE Polishing
Apply a reversed-phase or mixed-mode SPE cartridge/column to remove:

- Organic byproducts
- Ligands and excess reagents
- Residual salts or matrix impurities

4. Concentration and Isolation
Concentrate the purified solution and isolate the final material by crystallization, precipitation, or evaporation.

Analytical and Bioanalytical Workflow

1. SPE Cleanup First
Use an appropriate SPE phase to remove proteins, salts, lipids, and other matrix interferences.

2. Optional Metal Scavenging Step
If catalyst residues or metal ions may affect instrument performance, apply a metal scavenger to the cleaned extract.

3. Instrumental Analysis
Proceed with LC, GC, or MS analysis using a cleaner, more stable sample.

Process and Scale-Up Integration

Begin with small-scale screening of scavenger and SPE chemistries using cartridges or batch treatments.

Transition to bulk packed columns or large-volume batch operations for pilot or production-scale purification.

Maintain the same core chemistries across scales to ensure consistent performance and simplify process validation.

CLEAN-UP® FORMATS AND CONFIGURATIONS

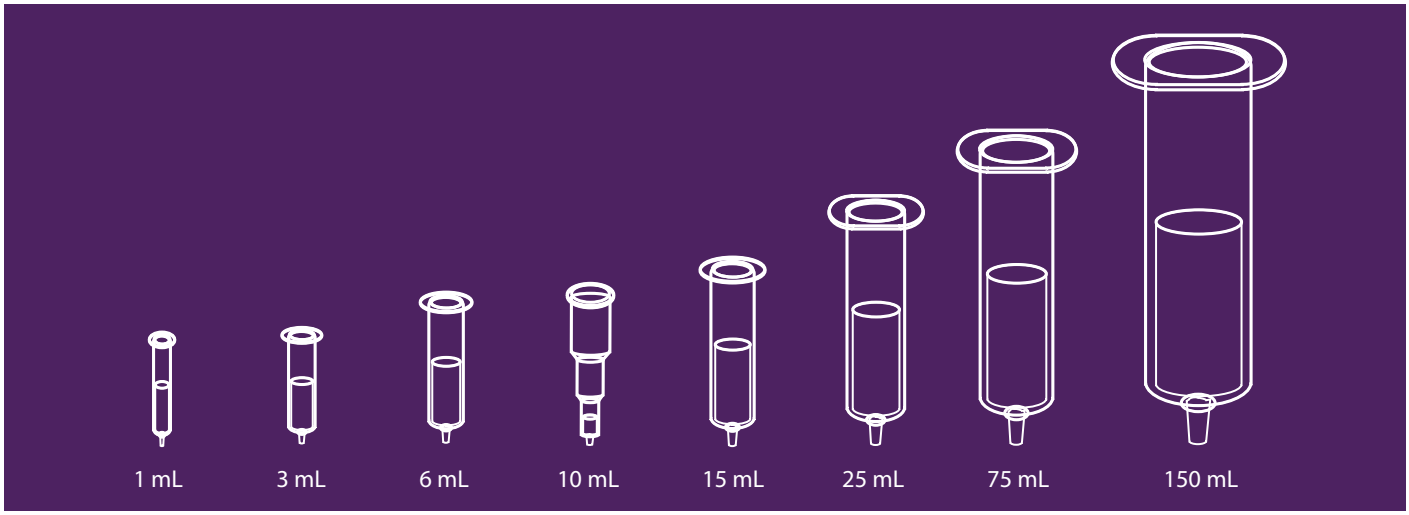
Metal Scavengers

- Bulk powder formats from small jars to multi-kilogram containers
- Standard particle size ranges suitable for gravity flow or mild pressure
- SPE cartridge formats (optional)
- Custom loading or particle size available upon request

SPE Sorbents

- SPE cartridges from 1 mL up to 150 mL with a wide range of bed masses
- Bed masses from 10 mg to 70 g
- Multi-well plates and bulk powder options for high-throughput screening or custom devices
- All products are manufactured with consistent frit quality, bed density, and packing integrity.

RESERVOIRS FOR BONDED PHASE EXTRACTIONS



CHEMISTRIES ARE OFFERED ON THESE SILICA SIZES...

SMALL PARTICLE (5-20 µm)

INTERMEDIATE PARTICLE (25-40 µm)

STANDARD PARTICLE (40-60 µm)

LARGE PARTICLE (125-210 µm)

SPE Column | Well-plate | Bulk

CLEAN-UP® SPE SORBENTS

While metal scavenging removes catalytic metals and certain inorganic residues, many workflows also require the removal of organic impurities, matrix components, and charged species. UCT's Clean-Up® SPE sorbents provide a comprehensive suite of bonded silica chemistries engineered to support these additional purification needs. Built on the same high-quality UCT-manufactured silica platform, our SPE products offer a versatile toolbox that includes hydrophobic, hydrophilic, ion-exchange, mixed-mode, and specialty phases, all available in a wide range of formats and configurations.

Key Features and Capabilities

- **Extensive chemistry coverage**
  C2–C30, phenyl, cyanopropyl, diol, silica, alumina, carbon, anion and cation exchangers, as well as multifunctional and mixed-mode phases.
- **Flexible formats and tube designs**
  SPE reservoirs available from 1 mL to 150 mL, with multiple bed masses and tube geometries, including both cylindrical and expanded-bed configurations.
- Particle size options for any workflow
  Small, standard, and large particle sizes designed for vacuum, positive-pressure, and gravity-flow applications.
- Wide application range
  Ideal for reaction polishing, LC/GC sample preparation, desalting, enrichment, fractionation, and removal of matrix interferences.

SOLID PHASE SORBENT SELECTION

Organic Loading & Exchange Capacity

Hydrophobic Phases

SORBENT	STRUCTURE	% Organic Loading
C2 ethyl	-SiCH_2CH_3	6.60
C4 n-butyl	-Si-$(CH_2)_3CH_3$	8.50
C8 octyl	-Si-$(CH_2)_7CH_3$	11.10
C18 octadecyl	-Si-$(CH_2)_{17}CH_3$	21.70
C30 tricontyl	-Si-$(CH_2)_{29}CH_3$	26.00
Cyclohexyl	-Si	11.60
Phenyl	-Si	11.00

Hydrophilic Phases

Silica	-SiOH	N/A
Diol	-Si-$(CH_2)_3OCH_2CHOHCH_2OH$	8.00
Cyanopropyl	-Si-$(CH_2)_3CN$	6.90
Florisil®		N/A
Alumina-Acid		N/A
Alumina-Neutral		N/A
Alumina-Base		N/A
Carbon		N/A

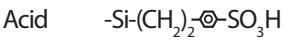
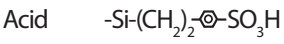
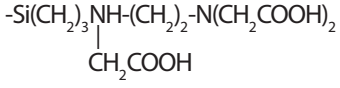
SOLID PHASE SORBENT SELECTION

Organic Loading & Exchange Capacity

Ion Exchange - Anion Extraction Phases

SORBENT	STRUCTURE	pKa	% Organic Loading	Exchange Capacity (meq/g)
Aminopropyl (1° amine)	$-Si(CH_2)_3NH_2$	9.8	6.65	0.310
N-2 Aminoethyl (1° & 2° amine)	$-Si(CH_2)_3NH(CH_2)_2NH_2$	10.1, 10.9	9.70	0.320
Diethylamino (3° amine)	$-Si(CH_2)_3N(CH_2CH_3)_2$	10.6	8.40	0.280
Triamine (1° & 2° amines)	$-Si(CH_2)_3NH(CH_2)_2NH(CH_2)_2NH_2$	10.75	13.5-15	1.2
Quaternary Amine with Chloride counter ion	$-Si(CH_2)_3N^+(CH_3)_3\ Cl^-$	Always Charged	8.40	0.250
Quaternary Amine with Acetate counter ion	$-Si(CH_2)_3N^+(CH_3)_3\ \ CH_3CO_2^-$	Always Charged	8.40	0.250
Quaternary Amine with Hydroxide counter ion	$-Si(CH_2)_3N^+CH_3)_3\ OH^-$	Always Charged	8.40	0.250
Quaternary Amine with Formate counter ion	$-Si(CH_2)_3N^+(CH_3)_3\ CHO_2^-$	Always Charged	8.40	0.250
Polyimine	$-Si(CH_2)_3$-R-$[NHCH_2CH_2]_X$	Always Charged	13.5	0.85

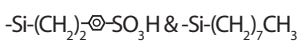
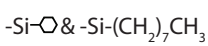
Ion Exchange - Cation Extraction Phases

SORBENT	STRUCTURE	pKa	% Organic Loading	Exchange Capacity (meq/g)
Carboxylic Acid	$-SiCH_2COOH$	4.8	9.10	0.170
Propylsulfonic Acid	$-Si(CH_2)_3SO_3H$	<1	7.10	0.180
Benzenesulfonic Acid		Always Charged	11.00	0.320
Benzenesulfonic Acid High Load		Always Charged	15.00	0.650
Triacetic Acid			7.61	Anion 0.17 Cation 0.06

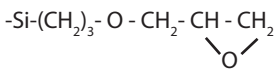
SOLID PHASE SORBENT SELECTION

Organic Loading & Exchange Capacity

Copolymeric (Multifunctional Phases)

SORBENT	STRUCTURE	% Organic Loading	Exchange Capacity (meq/g)
Aminopropyl + C8	$-Si(CH_2)_3NH_2$ & $-Si(CH_2)_7CH_3$	12.3	0.163
Quaternary Amine + C8	$-Si(CH_2)_3N+(CH_3)_3$ & $-Si(CH_2)_7CH_3$	13.60	0.160
Carboxylic Acid + C8	$-SiCH_2COOH$ & $-Si(CH_2)_7CH_3$	12.50	0.105
Propylsulfonic Acid + C8	$-Si(CH_2)_3SO_3H$ & $-Si(CH_2)_7CH_3$	14.62	0.114
Benzenesulfonic Acid + C8		12.30	0.072
Cyanopropyl + C8	$-Si(CH_2)_3CN$ & $-Si(CH_2)_7CH_3$	14.60	0.163
Cyclohexyl + C8		N/A	N/A

Covalent Phases

SORBENT	STRUCTURE	% Organic Loading
Epoxy		N/A
Aldehyde	$-Si(CH_2)_4CHO$	N/A
Isocyanate	$-Si(CH_2)_3NCO$	7.1
Thiopropyl	$-Si(CH_2)_3SH$	7.5-9.5
Thiopropyl	$-Si(CH_2)_3SH$	13.5

CLEAN-UP® METAL SCAVENGER PART NUMBERS

Product Part Numbers and Descriptions		
Thiol (SH)		
Description	**Part Number**	**Amount**
Thiol (SH), 5 grams	CETHXHL00V	5 g
Thiol (SH), 10 grams	CETHXHL00X	10 g
Thiol (SH), 25 grams	CETHXHL0XXV	25 g
Thiol (SH), 50 grams	CETHXHL00L	50 g
Thiol (SH), 100 grams	CETHXHL00C	100 g
Thiol (SH), 250 grams	CETHXHL0CCL	250 g
Thiol (SH), 500 grams	CETHXHL00D	500 g
Thiol (SH), 1000 grams	CETHXHL00K	1000 g
Thiourea (THU)		
Description	**Part Number**	**Amount**
Thiourea (THU), 5 grams	CUTHU00V	5 g
Thiourea (THU), 10 grams	CUTHU00X	10 g
Thiourea (THU), 50 grams	CUTHU00L	50 g
Thiourea (THU), 100 grams	CUTHU00C	100 g
Diamine (PSA)		
Description	**Part Number**	**Amount**
Diamine (PSA), 5 grams	CUPSA00V	5 g
Diamine (PSA), 10 grams	CUPSA00X	10 g
Diamine (PSA), 25 grams	CUPSA0XXV	25 g
Diamine (PSA), 50 grams	CUPSA00L	50 g
Diamine (PSA), 100 grams	CUPSA00C	100 g
Triamine (TRI)		
Description	**Part Number**	**Amount**
Triamine (TRI), 5 grams	CUTRI00V	5 g
Triamine (TRI), 10 grams	CUTRI00X	10 g
Triamine (TRI), 25 grams	CUTRI0XXV	25 g
Triamine (TRI), 50 grams	CUTRI00L	50 g
Triamine (TRI), 100 grams	CUTRI00C	100 g
Triacetic Acid (TAX)		
Triacetic Acid (TAX), 10 grams	CUTAX00X	10 g
Triacetic Acid (TAX), 100 grams	CUTAX00C	100 g
Kit		
Kit - includes 5 grams each of Thiopropyl, Thiourea, Triamine, and PSA	MSMIXMDK-5	5 g each

CLEAN-UP® SPE PART NUMBERS

CLEAN-UP® C2, ETHYL SORBENT

COLUMNS				
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Endcapped	Part Number
1	100	100	YES	CEC02111
1	100	100	NO	CUC02111
3	200	50	YES	CEC02123
3	200	50	NO	CUC02123
3	500	50	NO	CUC02153
6	500	30	YES	CEC02156
6	1000	30	YES	CEC021M6
10	100	50	YES	CEC0211Z

CLEAN-UP® C4, n-BUTYL SORBENT

COLUMNS				
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	End-capped	Part Number
1	100	100	YES	CECN4111
3	200	50	YES	CECN4123
6	500	50	YES	CECN4156
6	1000	30	YES	CECN41M6
75	10000	10	YES	CECN4110M75

CLEAN-UP® FLORISIL®

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	100	100	CUFLS111
3	200	50	CUFLS123
3	500	50	CUFLS153
6	500	50	CUFLS156
6	1000	30	CUFLS1M6
10	100	50	CUFLS11Z
10	200	50	CUFLS12Z
10	500	50	CUFLS15Z
15	1000	30	CUFLS1M15
15	2000	30	CUFLS12M15
25	5000	20	CUFLS15M25
75	10000	10	CUFLS110M75

CLEAN-UP® C8, OCTYL SORBENT

COLUMNS				
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Endcapped	Part Number
1	50	100	YES	CEC081L1
1	50	100	NO	CUC081L1
1	100	100	YES	CEC08111
3	50	50	YES	CEC081L3
3	50	50	NO	CUC081L3
3	100	50	YES	CEC08113
3	100	50	NO	CUC08113
3	200	50	YES	CEC08123
3	200	50	NO	CUC08123
3	500	50	YES	CEC08153
3	500	50	NO	CUC08153
6	500	50	YES	CEC08156
6	500	50	NO	CUC08156
6	1000	30	YES	CEC081M6
6	1000	30	NO	CUC081M6
10	100	50	YES	CEC0811Z
10	200	50	YES	CEC0812Z
10	500	50	YES	CEC0815Z
15	2000	20	YES	CEC0812M15
25	5000	20	YES	CEC0815M25
75	10000	10	YES	CEC08110M75

CLEAN-UP® CARBON, GRAPHITIZED, 120/400 MESH

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	50	100	CUCARBL1
3	150	50	CUCARB1L3
3	200	50	CUCARB23
3	250	50	CUCARB2L3
3	500	50	CUCARB53
6	250	30	CUCARB26
6	500	30	CUCARB56
6	1000	20	CUCARBM6
10	500	50	CUCARB5Z
15	1000	20	CUCARBM15

CLEAN-UP SPE PART NUMBERS

CLEAN-UP® C18, OCTADECYL SORBENT

COLUMNS				
Tube Volume (mL)	**Sorbent Amount (mg)**	**Units per Pack**	**Endcapped**	**Part Number**
1	50	100	YES	CEC181L1
1	50	100	NO	CUC181L1
1	100	100	YES	CEC18111
1	100	100	NO	CUC18111
3	50	50	YES	CEC181L3
3	50	50	NO	CUC181L3
3	100	50	YES	CEC18113
3	100	50	NO	CUC18113
3	200	50	YES	CEC18123
3	200	50	NO	CUC18123
3	500	50	YES	CEC18153
3	500	50	NO	CUC18153
3	1000	50	NO	CUC181M3
6	200	50	YES	CEC18126
6	500	50	YES	CEC18156
6	500	50	NO	CUC18156
6	1000	30	YES	CEC181M6
6	1000	30	NO	CUC181M6
6	2000	30	YES	CEC1812M6
10	100	50	YES	CEC1811Z
10	100	50	NO	CUC1811Z
10	200	50	YES	CEC1812Z
10	200	50	NO	CUC1812Z
10	500	50	YES	CEC1815Z
10	500	50	NO	CUC1815Z
15	2000	20	YES	CEC1812M15
15	2000	20	NO	CUC1812M15
25	5000	20	YES	CEC1815M25
25	5000	20	NO	CUC1815M25

WELL PLATES					
Number of Wells	**Sorbent Amount (mg)**	**Units per Pack**	**Extended Drip Tip**	**Endcapped**	**Part Number**
96	50	1	NO	YES	WSHCEC18105
96	100	1	NO	YES	WSHCEC1811
96	100	1	NO	NO	WSHCUC1811
96	200	1	NO	YES	WSHCEC1812

CLEAN-UP SPE PART NUMBERS

CLEAN-UP® C30, TRICONTYL SORBENT

COLUMNS				
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Endcapped	Part Number
1	100	100	YES	CEC30111
3	100	50	YES	CEC30113
3	200	50	YES	CEC30123
6	200	50	YES	CEC30126
6	500	50	YES	CEC30156
6	1000	30	YES	CEC301M6
10	200	50	YES	CEC3012Z
10	500	50	YES	CEC3015Z

CLEAN-UP® PHY, PHENYL SORBENT

COLUMNS				
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Endcapped	Part Number
1	50	100	YES	CEPHY1L1
1	100	100	YES	CEPHY111
1	100	100	NO	CUPHY111
3	200	50	YES	CEPHY123
3	200	50	NO	CUPHY123
3	500	50	YES	CEPHY153
3	500	50	NO	CUPHY153
6	500	50	YES	CEPHY156
6	500	50	NO	CUPHY156
6	1000	30	YES	CEPHY1M6
10	100	50	YES	CEPHY11Z
10	200	50	YES	CEPHY12Z
10	200	50	NO	CUPHY12Z

CLEAN-UP® PHARMA-SIL®

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	50	100	PHSIL1L1
1	100	100	PHSIL111
3	200	50	PHSIL123
6	500	50	PHSIL156
6	1000	30	PHSIL1M6
15	2000	20	PHSIL12M15
25	5000	20	PHSIL15M25

CLEAN-UP® CYH, CYCLOHEXYL SORBENT

COLUMNS				
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	End-capped	Part Number
1	100	100	YES	CECYH111
3	200	50	YES	CECYH123
3	200	50	NO	CUCYH123
3	500	50	YES	CECYH153
6	500	50	YES	CECYH156
6	1000	30	YES	CECYH1M6
15	2000	20	YES	CECYH12M15

WELL PLATE					
Number of Wells	Sorbent Amount (mg)	Units per Pack	Extended Drip Tip	End-capped	Part Number
96	50	1	NO	YES	WSH-PHY105

CLEAN-UP® UNBONDED SILICA, ACID WASHED

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	100	100	CUSIL111
3	100	50	CUSIL113
3	200	50	CUSIL123
3	500	50	CUSIL153
6	100	50	CUSIL116
6	500	50	CUSIL156
6	1000	30	CUSIL1M6
10	100	50	CUSIL11Z
10	500	50	CUSIL15Z
15	2000	20	CUSIL12M15
25	5000	20	CUSIL15M25
75	10000	10	CUSIL110M75
75	20000	10	CUSIL120M75

CLEAN-UP SPE PART NUMBERS

CLEAN-UP® ALUMINA, ACIDIC

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	100	100	CUALA111
3	200	50	CUALA123
3	500	50	CUALA153
6	500	50	CUALA156
6	1000	30	CUALA1M6
15	2000	20	CUALA12M15
25	5000	20	CUALA15M25
75	10000	10	CUALA110M75

WELL PLATE				
Number of Wells	Sorbent Amount (mg)	Units per Pack	Extended Drip Tip	Part Number
96	50	1	NO	WSHALA05

CLEAN-UP® ALUMINA, NEUTRAL

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	50	100	CUALN1L1
1	100	100	CUALN111
3	200	50	CUALN123
3	500	50	CUALN153
6	500	50	CUALN156
6	1000	30	CUALN1M6
10	200	50	CUALN12Z
10	500	50	CUALN15Z
15	2000	20	CUALN12M15
25	5000	20	CUALN15M25
75	10000	10	CUALN110M75

CLEAN-UP® DIOL

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	100	100	CUDOL111
3	200	50	CUDOL123
3	500	50	CUDOL153
6	500	50	CUDOL156
15	2000	20	CUDOL12M15
25	5000	20	CUDOL15M25

CLEAN-UP® ALUMINA, BASIC

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
3	200	50	CUALB123
3	500	50	CUALB153
6	500	50	CUALB156
6	1000	30	CUALB1M6
10	200	50	CUALB12Z
10	500	50	CUALB15Z
15	2000	20	CUALB12M15
25	5000	20	CUALB15M25
75	10000	10	CUALB110M75

WELL PLATE				
Number of Wells	Sorbent Amount (mg)	Units per Pack	Extended Drip Tip	Part Number
96	50	1	NO	WSHALB105

CLEAN-UP® CN, CYANOPROPYL

COLUMNS				
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	End-capped	Part Number
1	50	100	YES	CECNP1L1
1	100	100	YES	CECNP111
1	100	100	NO	CUCNP111
3	100	50	NO	CUCNP113
3	200	50	YES	CECNP123
3	200	50	NO	CUCNP123
3	500	50	YES	CECNP153
6	500	50	YES	CECNP156
6	500	50	NO	CUCNP156
6	1000	30	YES	CECNP1M6
6	1000	30	NO	CUCNP1M6
10	200	50	YES	CECNP12Z
15	2000	20	YES	CECNP12M15
15	2000	20	NO	CUCNP12M15
75	10000	10	YES	CECNP110M75

CLEAN-UP SPE PART NUMBERS

CLEAN-UP® AMINOPROPYL SORBENT

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	50	100	CUNAX1L1
1	100	100	CUNAX111
3	200	50	CUNAX123
3	500	50	CUNAX153
6	500	50	CUNAX156
6	1000	30	CUNAX1M6
10	100	50	CUNAX11Z
10	200	50	CUNAX12Z
10	500	50	CUNAX15Z
15	2000	20	CUNAX12M15
25	5000	20	CUNAX15M25
75	10000	10	CUNAX110M75

WELL PLATES				
Number of Wells	Sorbent Amount (mg)	Units per Pack	Extended Drip Tip	Part Number
48	100	1	NO	WIMNAX11
48	300	1	NO	WIMNAX13
96	50	1	NO	WSHNAX105
96	100	1	NO	WSHNAX11
96	200	1	NO	WSHNAX12
96	300	1	NO	WSHNAX13

CLEAN-UP® QUATERNARY AMINE WITH CHLORIDE COUNTER ION SORBENT

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	50	100	CUQAX1L1
1	100	100	CUQAX111
3	200	50	CUQAX123
3	500	50	CUQAX153
6	500	50	CUQAX156
6	1000	30	CUQAX1M6
10	100	50	CUQAX11Z
10	200	50	CUQAX12Z
15	2000	20	CUQAX12M15

WELL PLATE				
Number of Wells	Sorbent Amount (mg)	Units per Pack	Extended Drip Tip	Part Number
96	100	1	YES	WSHQAX11-LD

CLEAN-UP® PRIMARY/SECONDARY AMINE SORBENT

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	50	100	CUPSA1L1
1	100	100	CUPSA111
3	200	50	CUPSA123
3	500	50	CUPSA153
6	500	50	CUPSA156
6	1000	30	CUPSA1M6
10	100	50	CUPSA11Z
10	200	50	CUPSA12Z
15	2000	20	CUPSA12M15
75	10000	10	CUPSA110M75

WELL PLATE				
Number of Wells	Sorbent Amount (mg)	Units per Pack	Extended Drip Tip	Part Number
96	100	1	NO	WSHPSA11

CLEAN-UP® DIETHYLAMINO SORBENT

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	100	100	CUDAX111
3	200	50	CUDAX123
3	500	50	CUDAX153
6	500	50	CUDAX156
6	1000	30	CUDAX1M6
10	500	50	CUDAX15Z
15	2000	20	CUDAX12M15
25	5000	20	CUDAX15M25

WELL PLATE				
Number of Wells	Sorbent Amount (mg)	Units per Pack	Extended Drip Tip	Part Number
96	50	1	NO	WSHDAX105

CLEAN-UP SPE PART NUMBERS

CLEAN-UP® QUATERNARY AMINE WITH HYDROXIDE COUNTER ION SORBENT

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	50	100	CHQAX1L1
1	100	100	CHQAX111
3	200	50	CHQAX123
3	500	50	CHQAX153
6	500	50	CHQAX156
6	1000	30	CHQAX1M6
10	100	50	CHQAX11Z
10	200	50	CHQAX12Z
15	2000	20	CHQAX12M15

CLEAN-UP® BENZENESULFONIC ACID SORBENT

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	50	100	CUBCX1L1
1	100	100	CUBCX111
3	200	50	CUBCX123
3	500	50	CUBCX153
6	100	50	CUBCX116
6	500	50	CUBCX156
6	1000	30	CUBCX1M6
10	100	50	CUBCX11Z
10	200	50	CUBCX12Z
10	500	50	CUBCX15Z
15	1000	30	CUBCX1M15
15	2000	30	CUBCX12M15
75	10000	10	CUBCX110M75

WELL PLATES				
Number of Wells	Sorbent Amount (mg)	Units per Pack	Extended Drip Tip	Part Number
48	100	1	NO	WIMBCX11
96	50	1	NO	WSHBCX105

CLEAN-UP® QUATERNARY AMINE WITH ACETATE COUNTER ION SORBENT

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	100	100	CAQAX111
3	200	50	CAQAX123
3	500	50	CAQAX153
6	1000	30	CAQAX1M6
10	200	50	CAQAX12Z
10	500	50	CAQAX15Z
25	5000	20	CAQAX15M25

CLEAN-UP® POLYIMINE SORBENT

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	100	100	CUPAX111
3	200	50	CUPAX123
3	500	50	CUPAX153
6	150	50	CUPAX(150)6
6	500	50	CUPAX156
6	1000	30	CUPAX1M6

WELL PLATES				
Number of Wells	Sorbent Amount (mg)	Units per Pack	Extended Drip Tip	Part Number
48	300	1	NO	WIMPAX13
96	100	1	NO	WSHPAX11
96	200	1	NO	WSHPAX12
96	300	1	NO	WSHPAX13

CLEAN-UP® BENZENESULFONIC ACID HIGH LOAD SORBENT

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	100	100	CUBCX1HL11
3	200	50	CUBCX1HL23
3	500	50	CUBCX1HL53
6	150	50	CUBCX1HL(150)06
6	500	50	CUBCX1HL56
6	1000	50	CUBCX1HL1M6
10	100	50	CUBCX1HL1Z
10	200	50	CUBCX1HL2Z
15	2000	20	CUBCX1HL2M15
75	10000	10	CUBCX1HL10M75

CLEAN-UP SPE PART NUMBERS

CLEAN-UP® CARBOXYLIC ACID SORBENT

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	50	100	CUCCX1L1
1	100	100	CUCCX111
3	200	50	CUCCX123
3	500	50	CUCCX153
6	500	50	CUCCX156
6	1000	30	CUCCX1M6
10	100	50	CUCCX11Z
10	200	50	CUCCX12Z
15	2000	20	CUCCX12M15
25	5000	20	CUCCX15M25

WELL PLATES				
Number of Wells	Sorbent Amount (mg)	Units per Pack	Extend-ed Drip Tip	Part Number
48	100	1	NO	WIMCCX11
48	300	1	NO	WIMCCX13
96	50	1	NO	WSHCCX105
96	100	1	NO	WSHCCX11
96	100	1	YES	WSHCCX11-LD

CLEAN-UP® TRIACETIC ACID SORBENT

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	100	100	CUTAX111
3	200	50	CUTAX123
3	500	50	CUTAX153
6	300	50	CUTAX136
6	500	50	CUTAX156
6	1000	30	CUTAX1M6
10	200	50	CUTAX12Z
75	10000	10	CUTAX110M75

CLEAN-UP® OCTYL PLUS CYCLOHEXYL SORBENT

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
6	500	50	CUCYH256
6	1000	30	CUCYH21M6
6	100	50	CUCYH21Z

CLEAN-UP® PROPYLSULFONIC ACID SORBENT

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	100	100	CUPCX111
3	200	50	CUPCX123
3	500	50	CUPCX153
6	500	50	CUPCX156
6	1000	30	CUPCX1M6
10	100	50	CUPCX11Z
10	200	50	CUPCX12Z

CLEAN-UP® OCTYL PLUS PROPYLSULFONIC SORBENT

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	50	100	CUPCX2L1
1	100	100	CUPCX211
3	200	50	CUPCX223
6	500	50	CUPCX256
10	200	50	CUPCX22Z

CLEAN-UP® OCTYL PLUS CARBOXYLIC ACID SORBENT

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	50	100	CUCCX2L1
1	100	100	CUCCX211
3	200	50	CUCCX223
6	500	50	CUCCX256
75	10000	10	CUCCX210M75

CLEAN-UP SPE PART NUMBERS

CLEAN-UP®
OCTYL PLUS BENZENESULFONIC ACID SORBENT

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	50	100	CUBCX2L1
1	100	100	CUBCX211
3	200	50	CUBCX223
3	500	50	CUBCX253
6	500	50	CUBCX256
6	1000	30	CUBCX2M6
10	100	50	CUBCX21Z
10	200	50	CUBCX22Z
10	500	50	CUBCX25Z

WELL PLATES				
Number of Wells	Sorbent Amount (mg)	Units per Pack	Extended Drip Tip	Part Number
48	500	1	NO	WIMBCX25
48	1000	1	NO	WIMBCX2M
96	50	1	NO	WSHBCX205
96	100	1	NO	WSHBCX21

CLEAN-UP® OCTYL PLUS QUATERNARY AMINE SORBENT

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	50	100	CUQAX2L1
1	100	100	CUQAX211
3	200	50	CUQAX223
3	500	50	CUQAX253
6	500	50	CUQAX256
6	1000	30	CUQAX2M6
10	200	50	CUQAX22Z
10	500	50	CUQAX25Z
15	2000	20	CUQAX22M15

WELL PLATE				
Number of Wells	Sorbent Amount (mg)	Units per Pack	Extended Drip Tip	Part Number
96	50	1	NO	WSHQAX205

CLEAN-UP® OCTYL PLUS AMINOPROPYL SORBENT

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	50	100	CUNAX2L1
1	100	100	CUNAX211
3	50	50	CUNAX2L3
3	200	50	CUNAX223
3	500	50	CUNAX253
6	1000	30	CUNAX2M6
10	100	50	CUNAX21Z
10	200	50	CUNAX22Z
15	2000	20	CUNAX22M15

WELL PLATE				
Number of Wells	Sorbent Amount (mg)	Units per Pack	Extended Drip Tip	Part Number
96	100	1	NO	WSHNAX21

CLEAN-UP® OCTADECYL PLUS BENZENESULFONIC ACID SORBENT

COLUMNS			
Tube Volume (mL)	Sorbent Amount (mg)	Units per Pack	Part Number
1	100	100	CUBCX311
3	50	50	CUBCX3L3
3	100	50	CUBCX313
3	200	50	CUBCX323
3	300	50	CUBCX333
3	500	50	CUBCX353
6	500	50	CUBCX356
6	1000	30	CUBCX3M6
10	100	50	CUBCX31Z
10	200	50	CUBCX32Z
10	300	50	CUBCX33Z
10	500	50	CUBCX35Z
15	2000	20	CUBCX32M15

WELL PLATE				
Number of Wells	Sorbent Amount (mg)	Units per Pack	Extended Drip Tip	Part Number
96	30	1	YES	WSHBCX303-LD

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