

metals • inorganics • organometallics • catalysts • ligands • custom synthesis • cGMP facilities • nanomaterials

<p>16-0200</p>	<p>16-0215</p>	<p>16-0650</p>
<p>16-1700, 16-1706, 16-1702, 16-1704</p>	<p>16-1540</p>	
<p>16-0210</p>		<p>Sold in collaboration with PhosphonicS Ltd. for research purposes only.</p> <p>Sold in 10g and 50g units.</p>

Metal scavengers are increasingly used as an effective way to solve metal removal problems associated with Active Pharmaceutical Ingredients (API's) and synthetic intermediates. This is an often complex technical challenge, influenced by a number of factors including the significant structural variations with API's, the polar functional groups which APIs tend to contain, the environment (solvent and pH) and potential incompatibilities within the API. PhosphonicS has designed a portfolio of silica-based materials containing a diverse range of functional groups to address effective metal scavenging.

Properties of PhosphonicS' Broad Portfolio of Metal Scavengers

- High Affinity for a **wide range of metals**, in **different oxidation states**
- **Fast kinetics** - highly active at ambient temperatures
- **High selectivity** for the metal, meaning **minimal loss of the API**/compound
- **Broad solvent and pH compatibility** with both organic and aqueous formulations, reducing the requirements of time-consuming and costly solvent switches
- **No swelling** of the materials are required
- **Excellent stability** - thermal, physical, chemical and mechanical
- **Very high purity** - **eliminating issues of extractable impurities**
- **Enhanced performance**, due to **multiple functional groups** and **higher effective loadings**
- **Metal recycling** options
- **Availability on Process scale**

Performance Benefits from using PhosphonicS' Metal Scavengers

- **Faster:** purification, batch processing, problem-solving, market introduction
- **Reduced:** Development time, valuable API losses, total manufacturing costs, environmental burden
- **Enhanced:** process, productivity, compliance

96-6750 PhosphonicS Metals Scavenging Kit - Contains a 10g unit of each of the following nine products

<p>16-0200</p>	<p>N-Acetyl-L-cysteine ethyl Silica (PhosphonicS SCYT1) white to off-white solid Silica size: 60-200 microns Loading: 0.6 mmol/g Scavenges: Ru(III), Rh(I), Rh(III), Pd(0), Pd(II), Pt(II)</p>	<p>Pore size: 60Å</p>
<p>16-0215</p>	<p>2-Aminoethyl sulfide ethyl Silica (PhosphonicS SEA) white to pale yellow solid Silica size: 60-200 microns Loading: 0.8 mmol/g Scavenges: Fe(III), Ni(II), Cu(II), Ru(III), Rh(I), Rh(III), Ag(I), Cd(II), Sn(II), Sn(IV), Pt(II), Hg(II), Pb(II)</p>	<p>Pore size: 60Å</p>
<p>16-0650</p>	<p>2-Mercaptoethyl ethyl sulfide Silica (PhosphonicS SEM26) white solid Silica size: 60-200 microns Loading: 0.8 mmol/g Scavenges: Fe(III), Ni(0), Cu(II), Ru(III), Rh(I), Rh(III), Pd(0), Pd(II), Ag(I), Pt(II), Hg(II)</p>	<p>Pore size: 60Å</p>

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16-1700	3-Mercaptopropyl ethyl sulfide Silica (60Å, high-cross linking) (PhosphonicS SPM36) white solid Silica size: 60-200 microns Loading: 0.8 mmol/g Pore size: 60Å Scavenges: Fe(III), Ni(II), Cu(II), Ru(III), Rh(I), Rh(III), Pd(0), Pd(II), Ag(I), Cd(II), Sn(II), Sn(IV), Pt(II), Au, Hg(II), Pb(II)
16-1706	3-Mercaptopropyl ethyl sulfide Silica (60Å, low-cross linking) (PhosphonicS SPM32) white to pale yellow solid Silica size: 60-200 microns Loading: 0.8 mmol/g Pore size: 60Å Scavenges: Fe(III), Ni(0), Ni(II), Cu(II), Ru(III), Rh(I), Rh(III), Pd(0), Pd(II), Ag(I), Cd(II), Sn(II), Sn(IV), Pt(II), Au, Hg(II), Pb(II)
16-1702	3-Mercaptopropyl ethyl sulfide Silica (90Å, high-cross linking) (PhosphonicS SPM36f) white to pale yellow solid Silica size: 60-200 microns Loading: 0.8 mmol/g Pore size: 90Å Scavenges: Fe(III), Ni(II), Cu(II), Ru(III), Rh(I), Rh(III), Pd(0), Pd(II), Ag(I), Cd(II), Sn(II), Sn(IV), Pt(II), Hg(II), Pb(II)
16-1704	3-Mercaptopropyl ethyl sulfide Silica (90Å, low-cross linking) (PhosphonicS SPM32f) white to pale yellow solid Silica size: 60-200 microns Loading: 0.8 mmol/g Pore size: 90Å Scavenges: Fe(III), Ni(0), Ni(II), Cu(II), Ru(III), Rh(I), Rh(III), Pd(0), Pd(II), Ag(I), Cd(II), Sn(II), Sn(IV), Pt(II), Au, Hg(II), Pb(II)
16-1540	Pentaerythritol 2-mercaptoacetate ethyl sulfide Silica (PhosphonicS SET) white solid Silica size: 60-200 microns Loading: 0.75 mmol/g Pore size: 60Å Scavenges: VO(II), Fe(III), Ni(II), Cu(II), Ga(III), Ru(II), Ru(III), Rh(I), Rh(III), Pd(0), Pd(II), Ag(I), Cd(II), Sn(II), Sn(IV), Pt(II), Au, Hg(II), Pb(II)
16-0210	Triamine ethyl sulfide amide Silica (PhosphonicS STA3) white solid Silica size: 60-200 microns Loading: 0.9 mmol/g Pore size: 60Å Scavenges: Al(III), VO(II), Cr(III), Mn(II), Fe(III), Co(II), Ni(II), Cu(II), Zn(II), Ga(III), Sr(II), Ru(III), Rh(I), Rh(III), Pd(0), Pd(II), Ag(I), Cd(II), Sn(II), Sn(IV), Pt(II), Hg(II), Pb(II), UO ₂ (II)

Scavenger	Pd(II)	Pd(0)	Pt	Rh(I)	Rh(III)	Ru(II)	Ru(III)	Ag(I)
16-0210	✓	✓	✓	✓	✓	✓	✓	✓
16-0650	✓	✓	✓	✓	✓		✓	✓
16-1706	✓	✓	✓	✓	✓		✓	✓
16-1704								
16-1700	✓	✓	✓	✓	✓		✓	✓
16-1702								
16-1540	✓	✓	✓	✓		✓	✓	✓
16-0215	✓	✓	✓	✓	✓		✓	✓
16-0200	✓	✓	✓	✓	✓		✓	

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