



# Maximising potential returns

Value Recovery Application Note

## Precious metal recovery for the electronics and pharmaceutical industries

### Phos series



- Quick return on investment
- Simple solution to a complex problem
- Low capex requirement



## About PhosphonicS

PhosphonicS know about metals. In fact, we're mad about them. We even go fishing in waste to find them. Using the smartest silica technology, our silica products are designed to extract precious metals from your stream, meaning you don't have to. What's more, our scientists relish designing simple solutions to complex metal recovery problems, so go on, give us a challenge.



## Introducing PhosphonicS Precious Metal Recovery Products

The Phos series of silica products are designed to recover precious metals from your process and waste streams.

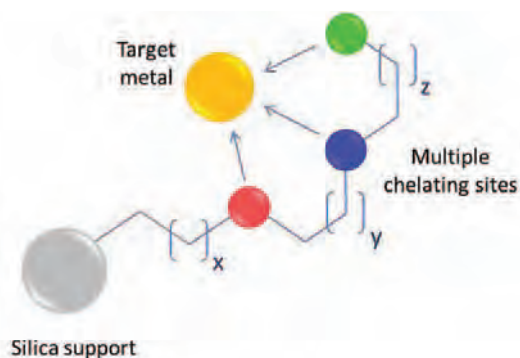
Product code	Product name
Phos-01	Mercaptoalkyl 2 Functionalised Silica
Phos-02	Aminoalkyl 3 Functionalised Silica
Phos-03	Aminoalkyl 1 Functionalised Silica
Phos-04	Mercaptoalkyl 1 Functionalised Silica
Phos-05	Mercaptoalkyl 4 Functionalised Silica
Phos-06	Alkyl Thiourea Functionalised Silica

You can order your Phos Screening Kit in one of three sizes: 10g, 50g or 100g. Please refer to Phos-Kit 10, Phos-Kit 50 or Phos-Kit 100.



## What Makes PhosphonicS Unique

PhosphonicS uses patented technology for attaching powerful ligands to silica backbone. The ability to incorporate multiple chelating sites enables our silica products to outperform other solid supported products, especially at low ppm concentrations of precious metal in your stream.



### Advantages of the Phos series

- More powerful than standard solid adsorbents
- Designed to only recover precious metals
- Superior recovery performance

### Advantages of silica as a support

- Highly porous for optimised stream flow
- Stable in both aqueous and organic media
- Larger surface area for higher loading

## PhosphonicS in the electronics industry

Precious metals are widely used in the electronics industry due to their unique physical properties. In particular, their ease of use in manufacturing operations involving soldering and bonding processes make them the materials of choice for high quality, high precision operations. In addition, the high abrasion and corrosion resistance of precious metals make them ideal for forming thin films for use in semiconductor wafer manufacture.

To meet the ever growing global demand for high volumes of electronics components and to remain competitive, it is imperative that companies operating in this industry maximise their returns by recovering value from traces of precious metals in their waste streams.

## Recovering precious metals in the pharmaceutical industry

Precious metal catalysts, in particular those based on Pd, are widely used in the pharmaceutical industry to carry out an extensive range of complex synthetic reactions during early stage research through to full scale manufacturing of APIs. During scale up and full production, a significant quantity of residual precious metal in the reaction washings can be lost, so we provide an opportunity to recover additional value and improve financial returns.

### Pd recovery from PCB manufacture



#### Result

- >99.5% Pd recovery
- 40-60g/kg loading

#### Stream

- Pd (5-40 ppm)
- Aqueous, pH 5.5
- 116 m<sup>3</sup> treated p.a.

### Au recovery from semiconductor manufacture



#### Result

- >99.5 % Au recovery
- 40-50 g/kg loading

#### Stream

- Au (85-100 ppm)
- Aqueous, pH 4
- 55 m<sup>3</sup> treated p.a.

### Pd recovery following a Heck reaction



#### Result

- 98 % Pd recovery
- 40 g/kg loading

#### Stream

- Pd (700 ppm)
- Aqueous-organic
- Multi-kilogram



## Order Your Phos Screening Kit

To order your Phos Screening Kit send an email requesting your choice of Phos-Kit 10, Phos-Kit 50 or Phos-Kit 100 to [sales@phosphonics.com](mailto:sales@phosphonics.com)



## Contact PhosphonicS

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