

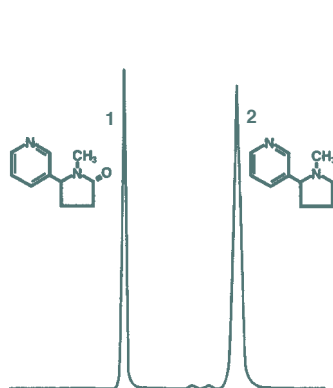
GammaBond™ Alumina

- Stable from pH 1.3 to 12
- Efficiencies to compete with the best silica based columns
- Available in low load RP-1 and octyl based RP-8
- GammaBond RP-1 is used for USP method L29

GammaBond Alumina is a family of exceptionally stable alumina-based HPLC columns designed for extreme pH applications to provide high efficiency and unique selectivity. GammaBond Alumina is manufactured by bonding a polymer to a highly stable porous spherical 5 μm alumina particle. This proprietary manufacturing process yields polymer-coated packings with the same high efficiency as traditional silica columns, but with all the advantages of alumina. The ES Industries' GammaBond reversed phase columns may be used with any

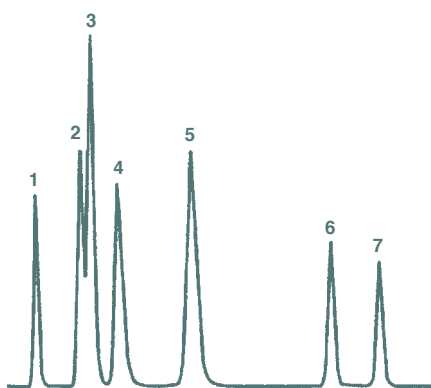
mobile phase from pH 1.3 to pH 12, and any desired buffer system or additive. GammaBond Alumina is available in two stationary phase types: GammaBond RP-1 and RP-8. GammaBond RP-1 is a low load polybutadiene coated alumina. This phase is used for USP method L-29. GammaBond RP-8 is an alumina based polysiloxane polymer to which n-octyl groups are appended.

GammaBond Alumina (RP1 or RP8):
pore size = 80° A; pH range = 1.3-12.



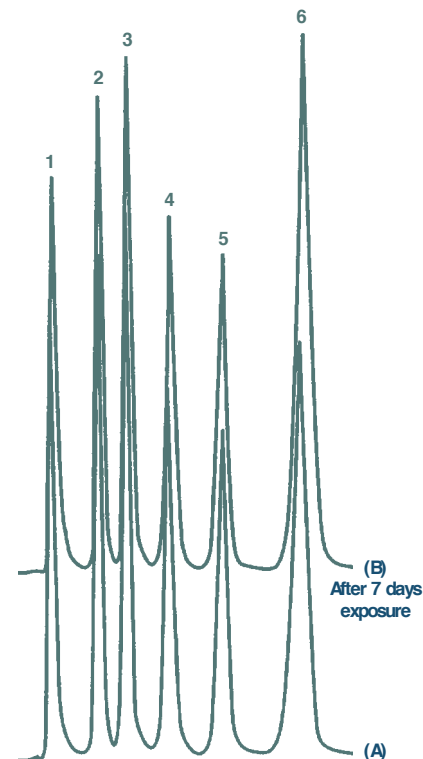
Alkyls

Column: GammaBond RP-2 (15 cm x 4.6 mm)
Mobile phase: 90:10 Water:Acetonitrile 25 mm
Borate Buffer pH = 12.0
Flow rate: 1 mL/min.
Temperature: 25°C
1. Cotinine
2. Nicotine



Long Term Base Test

Column: GammaBond RP-1 5 μ (15 cm x 4.6 mm)
Mobile phase: Acetonitrile: pH 9.3 Borate Buffer 10:90
with gradient to 30:70 from 4-8 minutes
Flow rate: 1 mL/min.
1. Simazine
2. Atrazine
3. Simetryn
4. Prometon
5. Ametryn
6. Prometryn
7. Terbutryn



Acid Stability

Column: GammaBond RP-1 (15 cm x 4.6 mm)
Mobile phase: 90:10 Water:Acetonitrile
pH = 1.3 (H₃PO₄)
Flow rate: 1 mL/min.
Temperature: 25°C
1. Nicotinic Acid
2. Furyl Acrylic Acid
3. 4-Nitrophenol
4. Hydrocinnamic Acid
5. Methyl Benzoate
6. Indole-3-propionic Acid

| Description | Particle Size (μ) | Length (mm) | Standard-bore P/N (4.6 mm) | Standard-bore P/N (4.0 mm) | Small-bore P/N (3.2 mm) | Small-bore P/N (2.0 mm) |
|--------------------|-------------------|-------------|----------------------------|----------------------------|-------------------------|-------------------------|
| Polybutadiene RP-1 | 5 | 50 | 115271-ARP1 | 114271-ARP1 | 11d271-ARP1 | 112271-ARP1 |
| Polybutadiene RP-1 | 5 | 100 | 125271-ARP1 | 124271-ARP1 | 12d271-ARP1 | 122271-ARP1 |
| Polybutadiene RP-1 | 5 | 150 | 135271-ARP1 | 134271-ARP1 | 13d271-ARP1 | 132271-ARP1 |
| Polybutadiene RP-1 | 5 | 250 | 155271-ARP1 | 154271-ARP1 | 15d271-ARP1 | 152271-ARP1 |
| Polybutadiene RP-8 | 5 | 50 | 115271-ARP8 | 114271-ARP8 | 11d271-ARP8 | 112271-ARP1 |
| Polybutadiene RP-8 | 5 | 100 | 125271-ARP8 | 124271-ARP8 | 12d271-ARP8 | 122271-ARP1 |
| Polybutadiene RP-8 | 5 | 150 | 135271-ARP8 | 134271-ARP8 | 13d271-ARP8 | 132271-ARP1 |
| Polybutadiene RP-8 | 5 | 250 | 155271-ARP8 | 154271-ARP8 | 15d271-ARP8 | 152271-ARP1 |