



COLUMN CONSIDERATIONS IN HIGH TEMPERATURE LIQUID CHROMATOGRAPHY

INTRODUCTION

HPLC columns have typically used silica particles as the substrate for bonding various nonpolar compounds. Silica based phases are generally unstable at temperature extremes under reverse phase conditions. At temperatures as low as 50°C, silica columns can degrade as water attacks the underlying silica support. Selerity Technologies has developed a polydentate silica phase that resists hydrolytic breakdown and minimizes column degradation. This note discusses hydrolytic breakdown mechanisms, polydentate chemistry and provides information on additional columns we have evaluated and found suitable for high temperature liquid chromatography (HTLC).

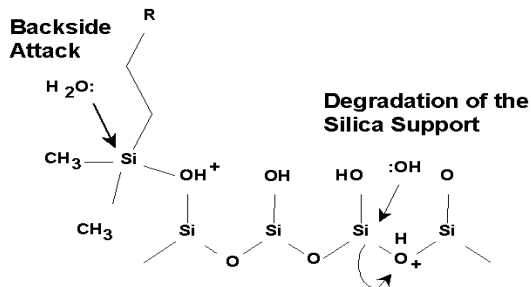
Selerity produces a family of silica columns specifically configured for HTLC that are stable up to 100°C. These columns are supplied with low dead-volume end fittings to maximize heat transfer and column efficiency.



SILICA COLUMNS CAN'T TAKE THE HEAT

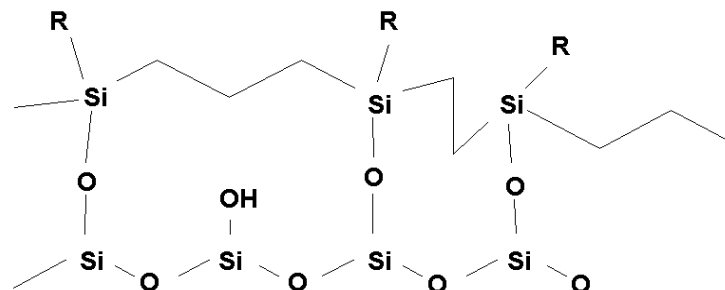
A silica column breaks down as water attacks the siloxane bonds or the underlying silica support.

Water attacks siloxane bond or behind point of phase attachment



The Selerity Blaze polydentate phase protects the silanol groups against attack. The polymer attaches to the silica structure at a number of points forming a protective cap over the hydrolytically unstable siloxane groups.

POLYDENTATE BONDED PHASE



COLUMNS FOR HIGH TEMPERATURE HPLC

Several column choices are available for high temperature applications up to 200°C.

Column Type	Stationary Phase	Column Parameters	Temperature Range
Selerity Blaze	polydentate silica C ₄ , C ₈ or phenyl	2.0 or 4.6 mm by 10 or 15 cm, 3µm	ambient to 100°C
Thermo Hypersil-Keystone Hypercarb	graphitic carbon	various dimensions, 5 and 7 µm packing	ambient to 200°C
Hamilton PRP-1 and PRP-3	polymeric (PSDVB) 100Å and 300Å pores	various dimensions and particle sizes	ambient to 150°C
Zirchrom	polymer coated zirconia	various dimensions and particle sizes	ambient to 150°C or 200°C