

## THERMAL SOLUTIONS

### Thermal Stability Determination of Bonded Silicas for use in Packing Columns by Thermogravimetric Analysis

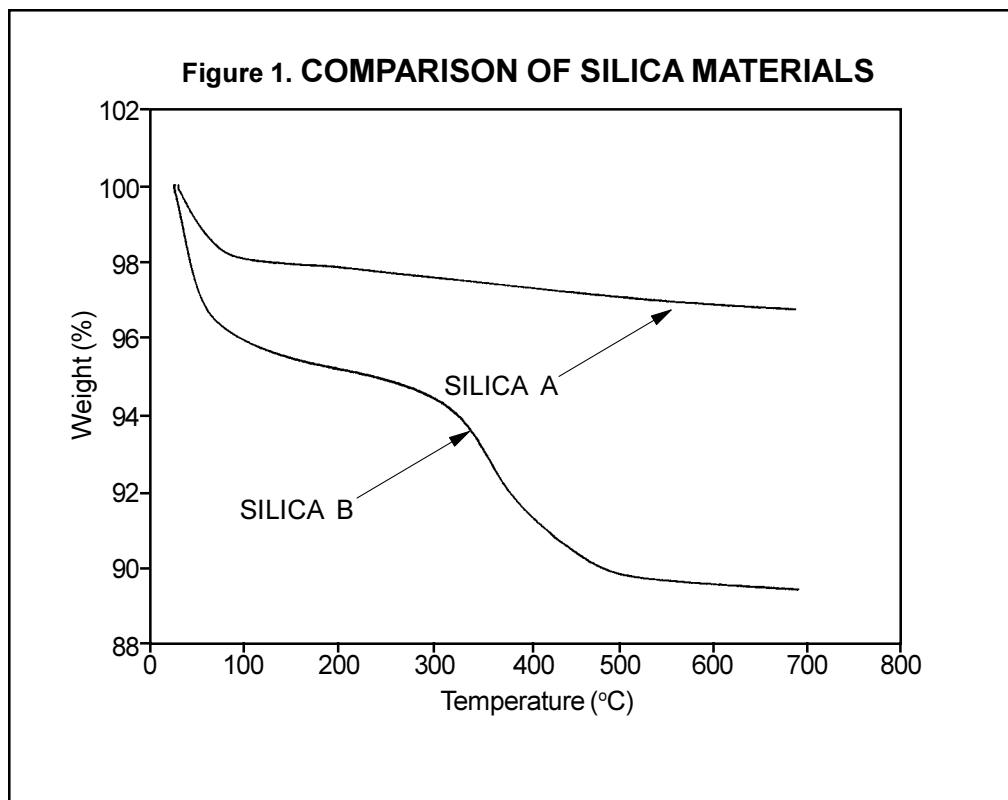
#### PROBLEM

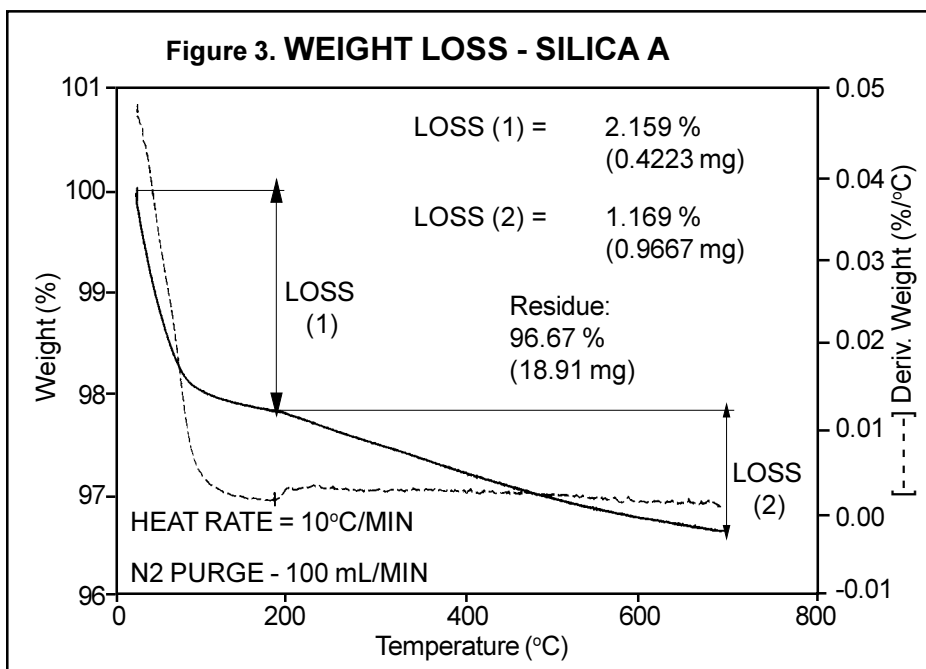
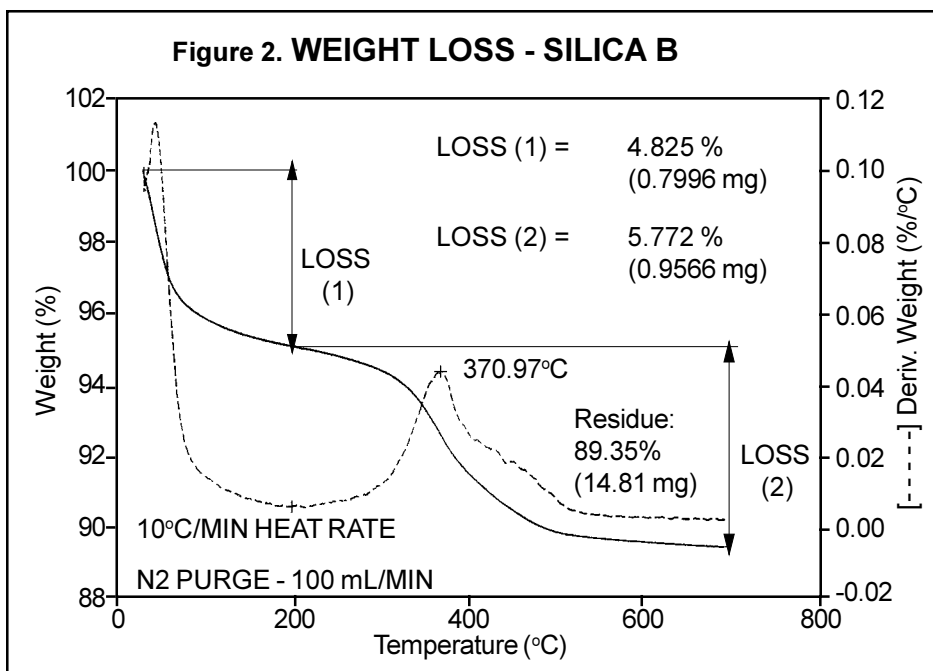
Silica materials used as chromatography support material gave inconsistent performance when packed in columns. This inconsistency was believed to be associated with poor bonding between the silica support and the active phase such that leaching occurred. Hence, a quick test which gave an indication of the stability of the bonding between the silica and active phase was desired.

#### SOLUTION

Thermogravimetric analysis (TGA), which is a thermal analysis technique used to measure weight changes in a material

with temperature, can provide information about the relative thermal stabilities of these silica packing materials which in turn provides an indication of the bond strength between the silica and active phase. Figure 1, for example, shows the comparative TGA results for a good and bad silica material. The good material (silica A), as expected, exhibited a smaller total weight loss over the temperature range evaluated. In both materials, the initial weight loss (Figures 2 and 3) represented the loss of surface moisture, while the second weight loss corresponded to loss of the active phase. Total analysis time was about an hour, but with faster heating rates or the use of an autosampler, the productivity of this TGA testing could easily be improved to levels acceptable for QC analysis.





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For more information or to place an order, contact:

**TA Instruments, Inc.**, 109 Lukens Drive, New Castle, DE 19720, Telephone: (302) 427-4000, Fax: (302) 427-4001

**TA Instruments S.A.R.L.**, Paris, France, Telephone: 33-01-30489460, Fax: 33-01-30489451

**TA Instruments N.V./S.A.**, Gent, Belgium, Telephone: 32-9-220-79-89, Fax: 32-9-220-83-21

**TA Instruments GmbH**, Alzenau, Germany, Telephone: 49-6023-30044, Fax: 49-6023-30823

**TA Instruments, Ltd.**, Leatherhead, England, Telephone: 44-1-372-360363, Fax: 44-1-372-360135

**TA Instruments Japan K.K.**, Tokyo, Japan, Telephone: 813-5434-2771, Fax: 813-5434-2770

Internet: <http://www.tainst.com>

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Thermal Analysis & Rheology  
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