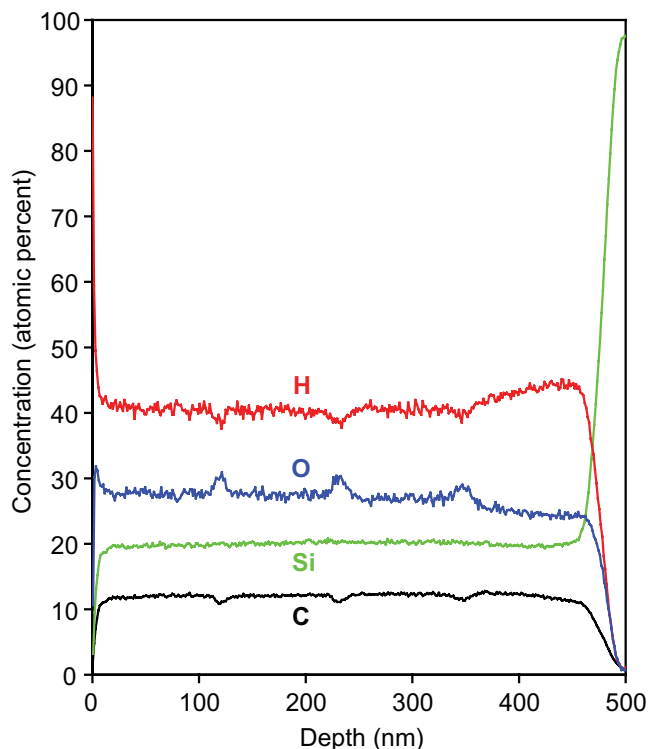


Discussion

The continually shrinking dimensions of integrated circuits bring new challenges for materials characterization. The use of Cu instead of Al for interconnects in silicon devices and the use of low-K dielectric materials to replace SiO₂ have led to significant advances in IC speed and performance, but also to complications with materials processing and integration. SIMS is one of the most valuable techniques for characterizing insulating, semiconductor, and metallic materials and can help solve process and integration problems. However, low-K dielectric materials introduce new issues for SIMS depth profiling. The unique insulating properties, chemical structure and often porous nature of the H or C-rich low-K materials make SIMS analysis very challenging since the analysis itself can degrade the material. Low-K films are made in a wide spectrum of compositions and there is usually no standard sample available for SIMS data quantification. At EAG, we have solved these issues.

EAG can provide:

- Measurements of the H, C, O, and Si depth profiles with minimal damage to the sample from the analysis.
- Improved impurity analyses, such as F, N, Cl, and other metal elements.
- Accurate quantification for all measured species and matrix using our unique reference materials.



SIMS profile of a porous organosilicate low-K film. From this measurement we can get the atomic percent of H, C, O, and Si as a function of depth. Periodic peaks and dips in the profile show interfaces in this multi-layer structure.

United States Locations

Tempe, Arizona
+1 480 239 0602 info.az@eaglabs.com
+1 602 470 2655 fax

Sunnyvale, California
810 Kifer Road
+1 408 530 3500 info.ca@eaglabs.com
+1 408 530 3501 fax

1135 E Arques Avenue
+1 408 738 3033
+1 408 530 3035 fax

785 Lucerne Drive
+1 408 737 3892
+1 408 737 3916 fax

Peabody, Massachusetts
+1 978 278 9500 info.ma@eaglabs.com
+1 978 278 9501 fax

Chanhassen, Minnesota
+1 952 828 6411 info.mn@eaglabs.com
+1 952 828 6449 fax

East Windsor, New Jersey
+1 609 371 4800 info.nj@eaglabs.com
+1 609 371 5666 fax

Syracuse, New York
+1 315 431 9900 info.ny@eaglabs.com
+1 315 431 9800 fax

Raleigh, North Carolina
+1 919 829 7041 info.nc@eaglabs.com
+1 919 829 5518 fax

Round Rock, Texas
+1 512 671 9500 info.tx@eaglabs.com
+1 512 671 9501 fax

International Locations

Shanghai, China
+ 86 21 6879 6088 info.cn@eaglabs.com
+ 86 21 6879 9086 fax

Tournefeuille, France
+ 33 5 61 73 15 29 info.fr@eaglabs.com
+ 33 5 61 73 15 67 fax

Frankfurt, Germany
+ 49 (0) 693053213 info.de@eaglabs.com
+ 49 (0) 69307941 fax

Tokyo, Japan
+ 81 3 5396 0531 info.jp@eaglabs.com
+ 81 3 5396 1930 fax

HsinChu, Taiwan
+ 886 3 5632303 info.tw@eaglabs.com
+ 886 3 5632306 fax

Uxbridge, United Kingdom
+ 44 (0) 1895 811194 info.uk@eaglabs.com
+ 44 (0) 1895 810350 fax