SILICON CARBIDE WAFER ANALYSIS

BY LIQUID SURFACE EXTRACTION ICP-MS

As Silicon Carbide (SiC) and next generation advanced semiconductors are making their way from niche to mainstream, all aspects necessary for commercialization need to fall in place. With current demands for higher efficiency, the SiC devices are already poised in the applications that demand minimum gate size and the highest performance. Control of impurities is critical to the manufacturing as shrinking technologies demand high quality and ultra-high purity substrates and epitaxial starting materials for wide band gap products based on SiC and GaN MOSFET technologies. Requirement for trace metal analysis is imperative and irrespective of the substrate type for shrinking nodes. Techniques such as TXRF and TOF-SIMS valuable up to a point fall short of method detection limits (MDLs) or fully quantitative results.

ADVANTAGES OF CHEMTRACE LIQUID SURFACE EXTRACTION ICP-MS TECHNIQUE

- Full Surface or Localized Scanning
- Fully Quantitative
- 30 Plus Elements from Li to U
- Superior Sensitivities

REASONS FOR TESTING SIC WAFERS BY LIQUID SURFACE EXTRACTION ICP-MS

SiC Wafer Manufacturers

- Monitor finished product cleanliness

OEMS & FABS

- Establish Incoming Baseline
- Compare Suppliers
- Qualify New Materials
- Monitor Process

ChemTrace offers Liquid Surface Extraction ICP-MS technique where formulated extraction solution is used to collect surface metals from SiC wafers and subsequently analyzed by ICP-MS/ICP-OES. Table below shows MDLs for typical trace metal analysis of 30 elements.

TRACE METAL METHOD DETECTION LIMITS FOR 6" SIC WAFERS

Element		MDL	Element		MDL
1	(Al)	0.6	16	(Pb)	0.006
2	(Sb)	0.004	17	(Li)	0.1
3	(As)	1	18	(Mg)	0.2
4	(Ba)	0.003	19	(Mn)	0.06
5	(Be)	0.4	20	(Mo)	0.004
6	(Bi)	0.002	21	(Ni)	0.1
7	(B)	10	22	(K)	0.4
8	(Cd)	0.006	23	(Na)	0.4
9	(Ca)	0.6	24	(Sr)	0.02
10	(Cr)	0.1	25	(Sn)	0.06
11	(Co)	0.1	26	(Ti)	0.1
12	(Cu)	0.04	27	(W)	0.002
13	(Ga)	0.006	28	(V)	0.02
14	(Ge)	0.02	29	(Zn)	0.1
15	(Fe)	0.2	30	(Zr)	0.02

Units in 10^{10} atoms/cm^2

contact us at Info@ChemTrace.com