PRESS RELEASE

Advanced analytical expertise for ensuring the quality of wafer surfaces.

Fraunhofer IPMS expands its service portfolio to include ultratrace elemental analysis on wafers

The Fraunhofer Institute for Photonic Microsystems IPMS is expanding its analytical capabilities in the field of wafer contamination. In a dedicated laboratory, the established method of vapor phase decomposition is used in combination with inductively coupled plasma mass spectrometry (VPD-ICP-MS). This combination enables precise monitoring of wafer surface contamination.

Wafers are thin, circular discs made of a semiconductor material used to manufacture microchips and other electronic components. The quality and purity of the wafer surface are crucial to the functionality and performance of the final products. Various characterization methods are used to detect and quantify contamination. Fraunhofer IPMS has expanded these methods to include ultratrace element analysis. After etching 200- or 300-millimeter wafers with hydrofluoric acid vapor, a droplet is applied to the wafer surface and moved across it. The droplet collects the soluble residues present on the surface and is then diluted to a volume of 1 ml. The dissolved elements are then analyzed using inductively coupled plasma mass spectrometry (ICP-MS). This process provides accurate quantitative information about the soluble elements on the wafer surface.

Ultratrace element analysis provides a wide range of possibilities. Surface and bevel scans are performed using an HF scan solution to analyze 39 elements, enabling detailed characterization of the wafer surface. For specific applications, aqua regia can be used as a scan solution for five noble metals.

Laboratory Equipment at Fraunhofer IPMS

The laboratory is equipped with cutting-edge technology, including the WSPS2 Wafer Surface Preparation System from PVA Tepla and the iCap RQ mass spectrometer from Thermo Scientific. These technologies enable accurate characterization and quality assurance in the semiconductor industry.
Through this expansion, Fraunhofer IPMS is strengthening its position as a leading research institute in wafer analysis and improving production quality in semiconductor manufacturing.

More information on the available characterization methods can be found on the institute's website. For further details, contact Nicole Nagy at nicole.nagy@ipms.fraunhofer.de.

Editor
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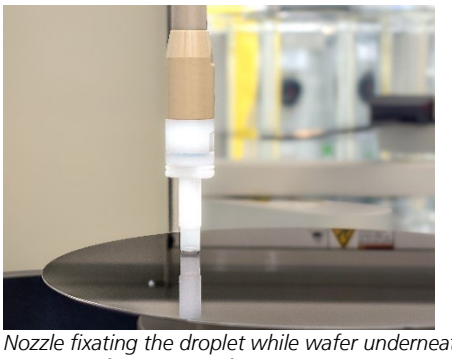
About Fraunhofer IPMS

Fraunhofer IPMS is a leading international research and development service provider for electronic and photonic microsystems in the application fields of Smart Industrial Solutions, Bio and Health, Mobility as well as Green and Sustainable Microelectronics. Research focuses on customer-specific miniaturized sensors and actuators, MEMS systems, microdisplays and integrated circuits as well as wireless and wired data communication. Services range from consulting and design to process development and pilot series production. With the Center Nanoelectronic Technologies (CNT), Fraunhofer IPMS offers applied research on 300 mm wafers for microchip producers, suppliers, device manufacturers and R&D partners.

Images



Nozzle fixating the droplet while wafer underneath rotates performing a surface scan
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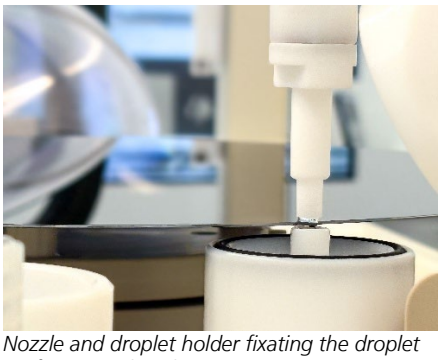

Nozzle and droplet holder fixating the droplet performing a bevel scan
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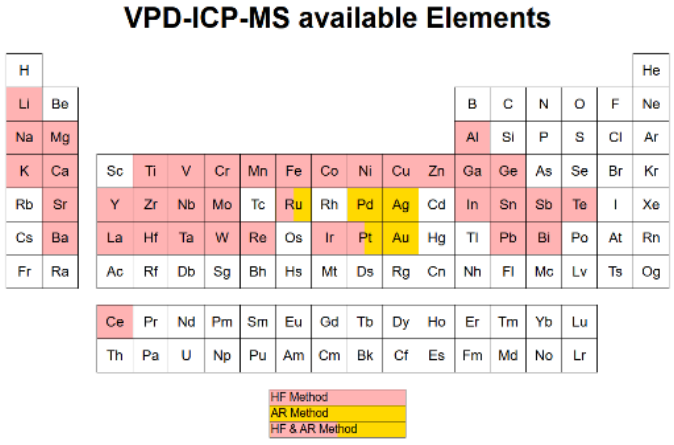

VPD-ICP-MS available Elements
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