ANALYSIS OF TRACE VOCS' IN CLEAN ROOM AIR WITH PDMS/CARBOXEN SPME FIBERS

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Quantification, elucidation of their origin and control or treatment of Airborne Molecular Contamination (AMC) is of increasing concern in semiconductor manufacturing regarding both production yield (via transfer of contamination to the wafer surface) and ESH issues.

Analytical techniques are being developed for the high sensitivity detection in clean room air and their correlated wafer contamination of molecular acids, bases, dopants and of organics and nitrogen bearing molecules.

Solid Phase Micro Extraction (SPME) is a fast, sensitive and solventless sampling technique. When coated with PDMS/Carboxen, it shows interesting preconcentration factors. It enables an exhaustive off-line analysis using classical analytical tools like GC/MS. To recover the adsorbed compounds the fibre is thermally desorbed into the GC injector without any additional equipment.

The method has been applied to the quantitative analysis of VOCs' at very low concentrations in an IC fab.

The on-site analysis (photolithography and wet bench area) has been compared to the analysis conducted one the outside air and in the plenum. Origin and relative significance of the clean room air contamination are discussed.