

APPLICATION SHEET

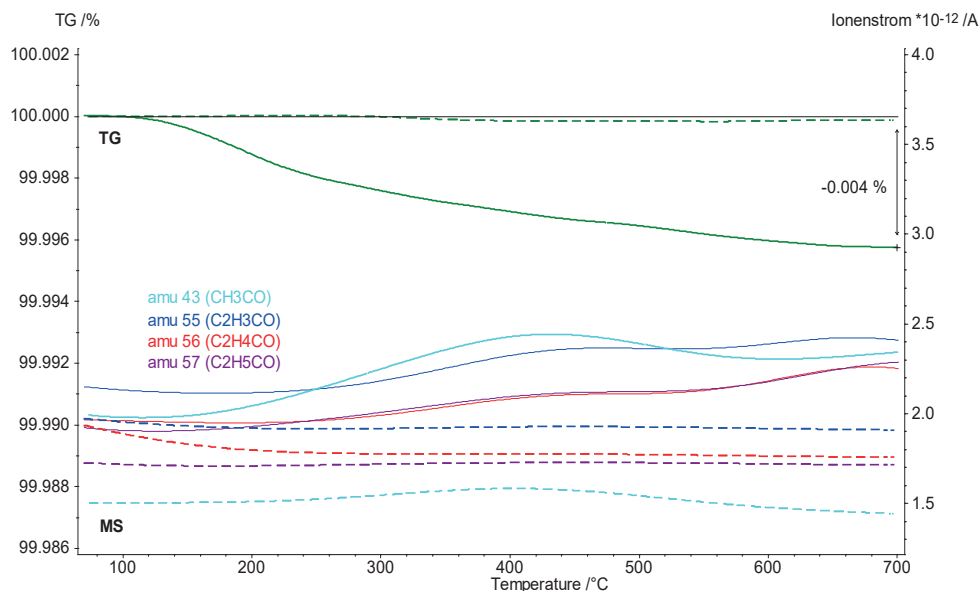
Metals/Alloys · Electronics Industry
STA 449 **F1 Jupiter**® - QMS 403 **Aëolos**®

Semiconductor Substrates

Introduction

Integrated circuits (ICs) have become indispensable for electronic devices and so for our daily life. For example, electronic control units (ECUs), sensors and actuators play an increasingly important role in the automotive industry.

For the production of integrated circuits, however, also highly clean substrates are required. These two key properties are not easy to achieve since, for example, polishing of the substrate can result in contamination of the substrate.



Test Conditions

Temperature range: RT ... 750°C
Heating/cooling rates: 10 K/min
Atmosphere: Argon at 70 ml/min
Sample mass: 4.64 mg
Crucible: Al₂O₃ plate
Sensor: TGA type S

Test Results

Using Thermogravimetry (TGA) and simultaneous mass spectrometry (MS), a contaminated metal substrate (full lines) could be distinguished from a clean substrate (dashed lines): Upon heating to 700°C, the mass of the contaminated sample decreased by 0.004%. This mass loss is most probably due to the evaporation of wax impurities since several organic acyl and carbonyl molecules and fragments were detected simultaneously. The amount of wax corresponds to a surface layer with a thickness in the micrometer range. For the detection of such small amounts, high sensitivity and good reproducibility of both the thermobalance and the mass spectrometer are prerequisites.