

Technical Note 120604
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AMD Mini-QuAS³AR, a new API-MS Mass Spectrometer

A) Introduction

Previous Application Notes describe some results obtained with the existing API-MS Evaluation Model: Application Note 120329 (ESI-MS Elemental Trace Analysis of Alkali metals in water); Application Note 120419 (APCI-MS Trace Analysis of volatile organic compounds in ambient air); and Application Note 120427 (GD-MS Trace Analysis of volatile organic compounds in ambient air). Supplementary, we describe here in short-form some technical aspects of the miniaturized API-MS System, considered to be the basis for dedicated product versions in above mentioned application areas.

B) Short-form Description of a unique System

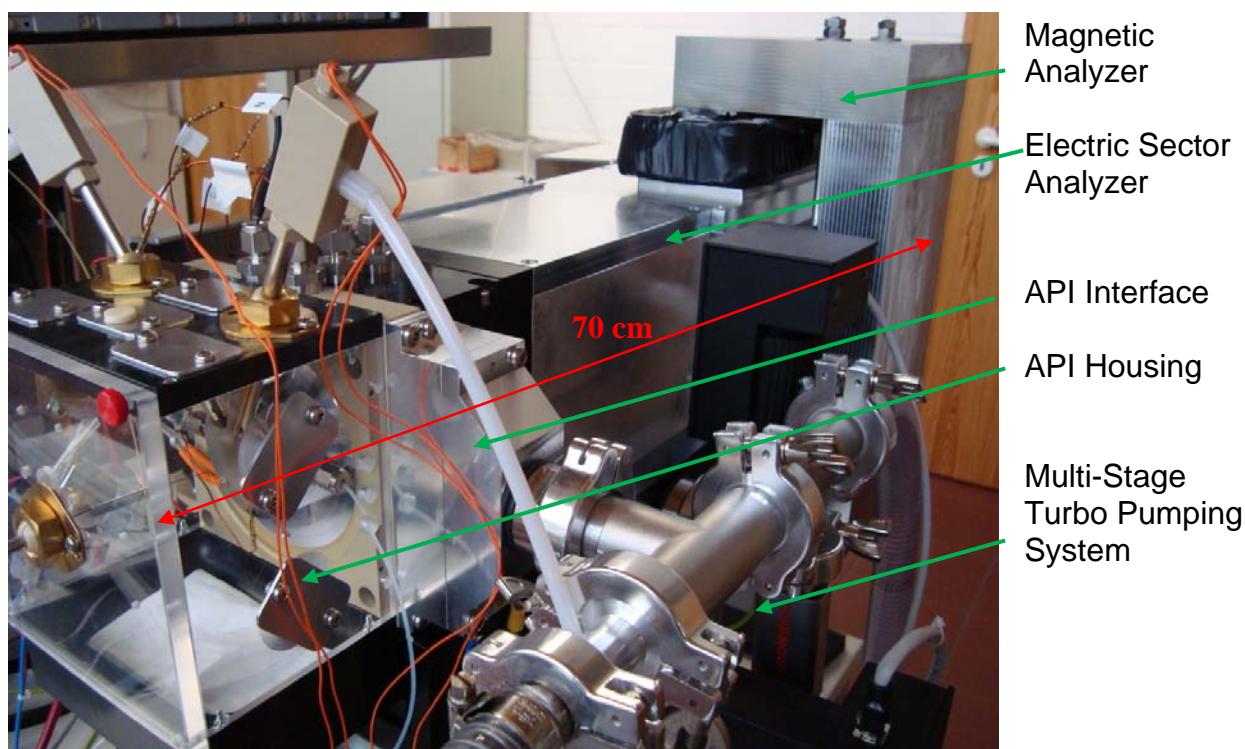


Fig. 1 Evaluation Model of the new bench-top Mass Spectrometer **AMD Mini-QuAS³AR**, equipped with an **Atmospheric Pressure Ionization (API) Interface**

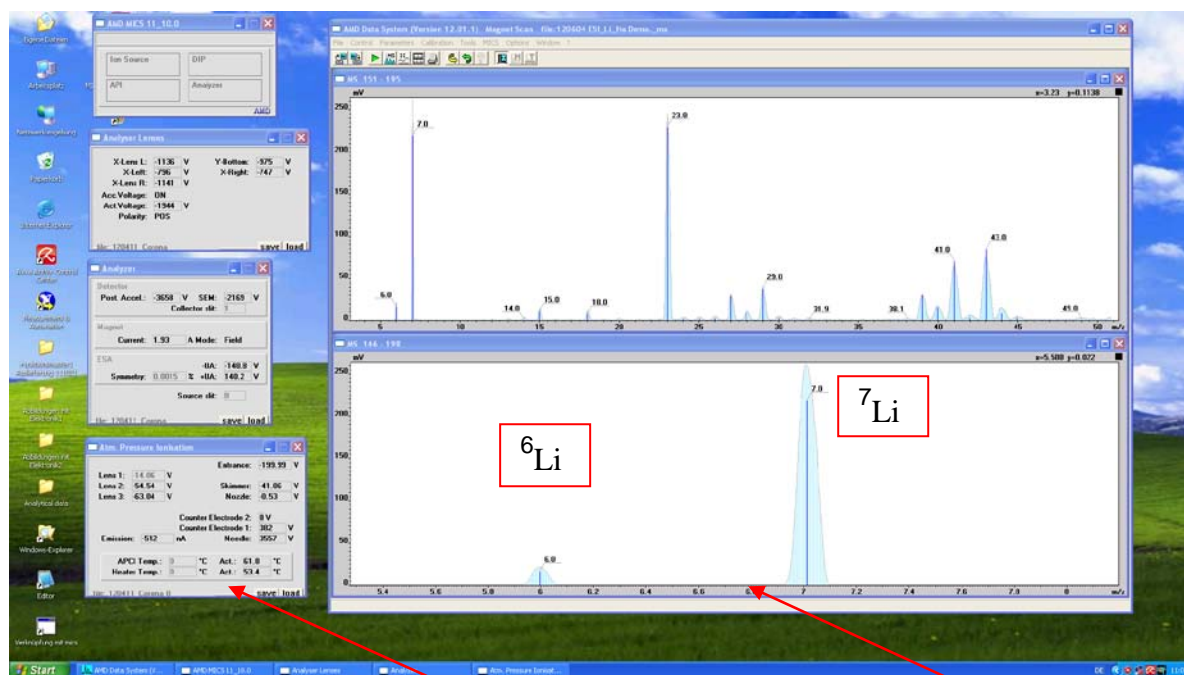


Fig. 2 Screen shot of the AMD Multi-Instrument-Control System (MICS) and AMD data system

The experimental version of the AMD Mini-QuAS³AR is a double focusing mass spectrometer based on a Mattauch-Herzog ion optical design with a straight focal plane suitable for the incorporation of an array detector for simultaneous ion detection in a wide mass range. The dedicated and miniaturized system is based on the original AMD QuAS³AR Technology. Emphasis regarding the API interface and the analyzer design has been placed to the analysis of low mass ions. The system incorporates the significant advantages of magnetic sector mass spectrometers for qualitative and quantitative analyses of low mass ions regarding peak shape, resolution and abundance sensitivity. The API-MS interface and the mass analyzer are integrated with a multi-stage turbo pumping system.

C) Technical Data Summary

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| 1 Analyzer: | Magnetic sector analyzer system in double focusing EB configuration with straight focal plane |
| 2 Resolution: | Point detector: 30 - 300 (10 % valley) selectable |
| 3 Mass range: | 1 - 400 Dalton at 2 kV accelerating voltage |
| 4 Scan range: | B-scan: full mass range
V/E-scan: 0.3 mass decade (factor 2) |
| 5 Scan speed: | B-scan: max. 0.5 sec/mass decade
V/E-scan: max. 30 msec/scan |
| 6 Limit of Detection: | ppb – low ppt range (depending on ionization method and sample) |
| 7 Polarity: | Kation or Anion detection |
| 8 Instrument Control: | Multi-Tasking Instrument-Control-System (AMD MICS) for processor controlled system functions |
| 9 Data System: | AMD Data system (version 2012); PC , state of the art technology, Windows™ operating system |
| 10 Ionization Methods: | ESI/APCI, Glow Discharge with API Interface optimized for low mass ions |