

DEVELOPMENT OF MINIATURIZED AQUEOUS CHEMISTRY SYSTEMS (MACS)

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Past and Today:

Automatized systems for

- chromatography (e.g. ARCA II) or
- solvent extraction (e.g. SISAK).

ARCA II – A New Apparatus for Fast, Repetitive HPLC Separations

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Dedicated to Prof. F. Baumgärtner on the occasion of his 60th birthday

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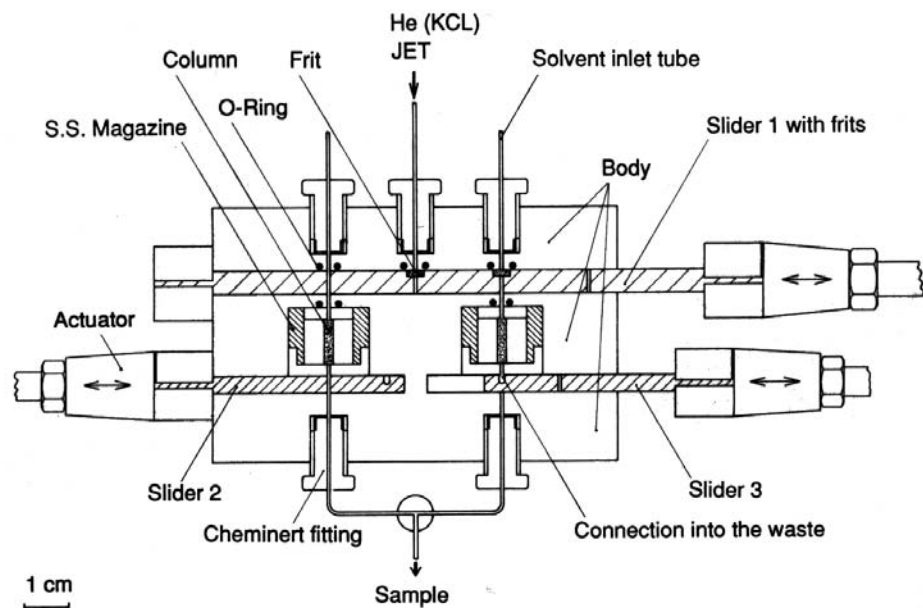


Fig. 1. View of the middle sectional plane of the compact catcher/chemistry unit of ARCA II.

Virtues:

- Good separation from transfer products
- High repeatability
- High reproducibility

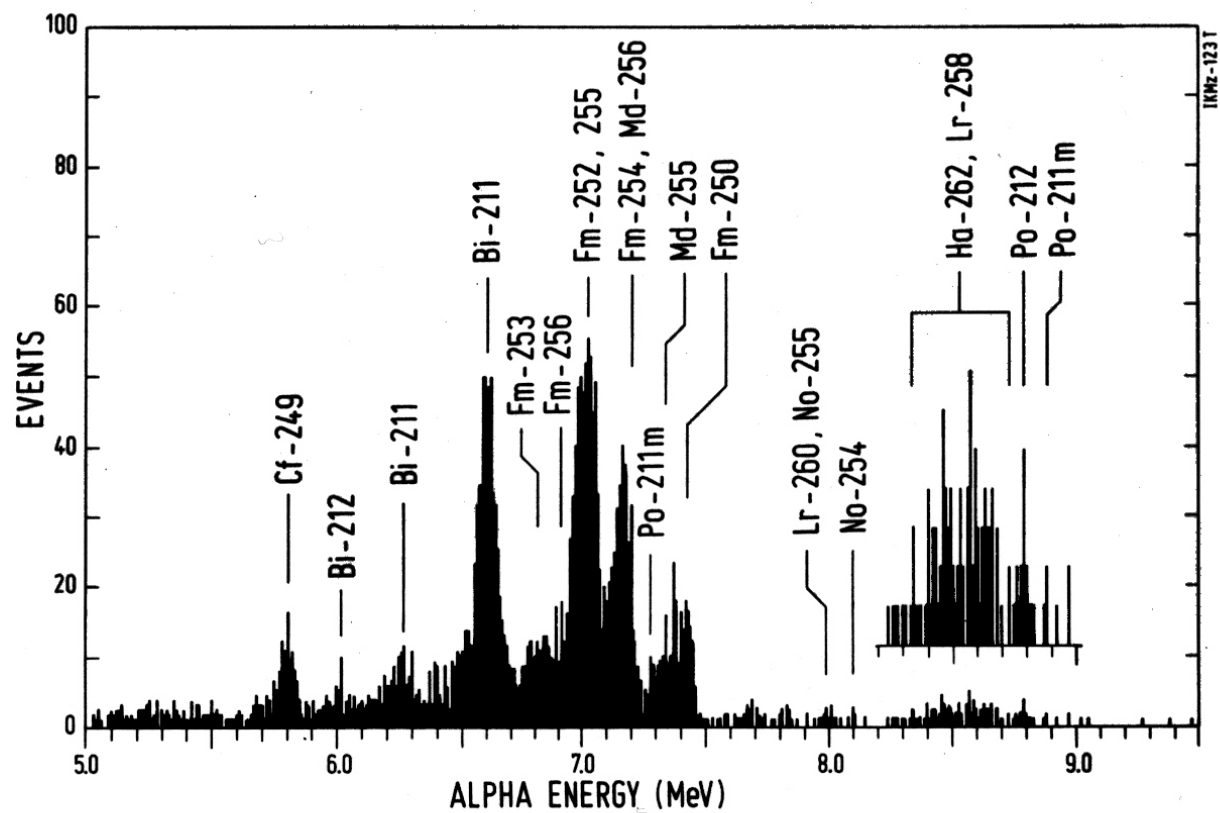


Fig. 2. Sum spectrum of all alpha-particle spectra containing alpha events with energies between 8.3 and 8.7 MeV. The vertical scale on the insert of the high energy portion has been expanded.

Disadvantages:

- Amount of solvents handled are still too large for
 - single atoms at-a-time decaying
 - with short half-lives
 - by α -decay (and sf)
- High losses during sample preparation
- Low spectral resolution for direct measurement
by silicon detectors or LSC

Goals:

- Minimize volume of solvents
- Minimize time for sample preparation

Solid state detectors with modified surfaces

Chemisorption by

- Anion Exchange
- Cation Exchange
- Specific complexation

Nanofluidic systems available from

- Combinatorial chemistry
- Biotechnology

Design Problem:

Interface to

target chamber or

recoil separator