

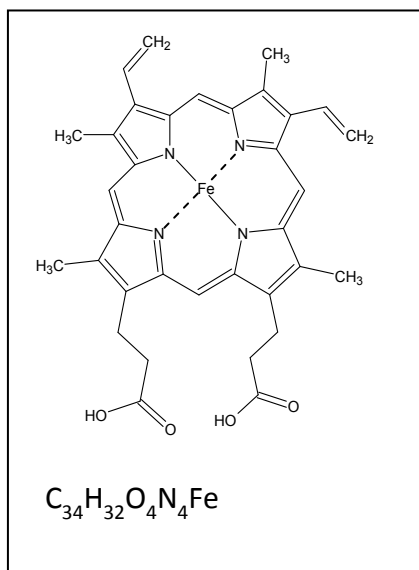
The Latest Developments in DART Applications

John Dane
JEOL USA, Inc.

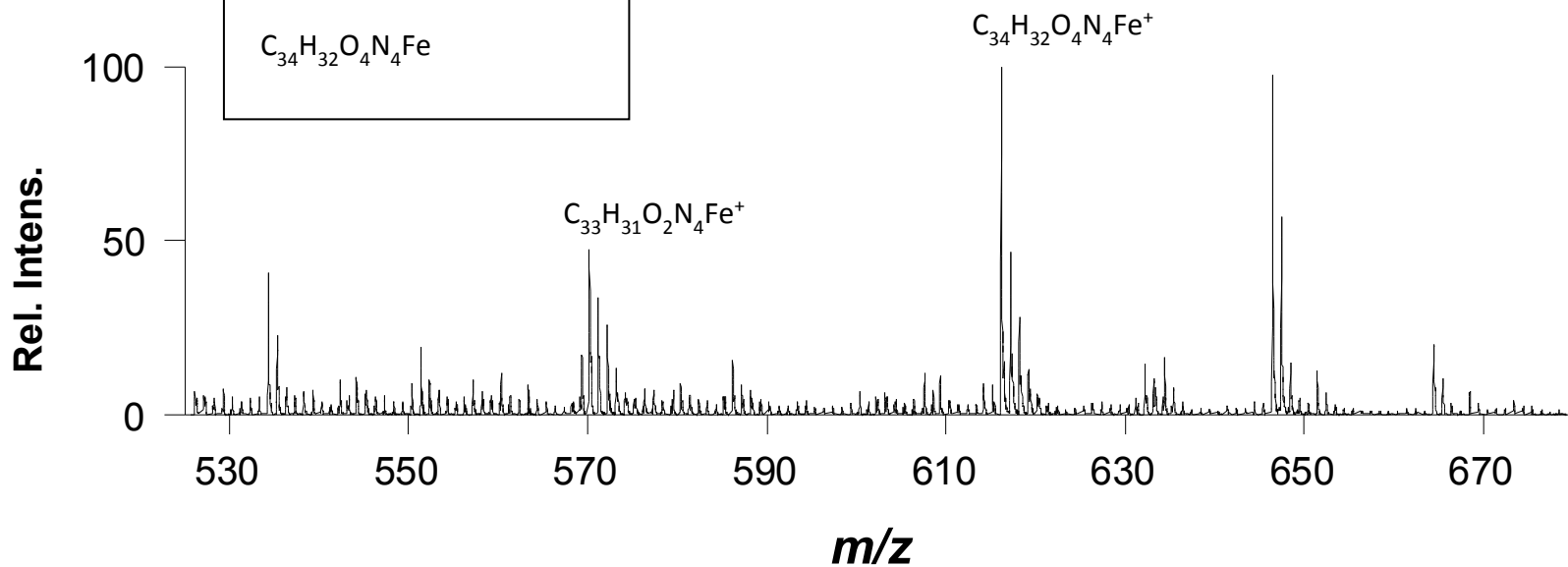
Heme as Biomarker for Blood in Cave Paintings

- Work done by Prof. Ruth Ann Armitage (Eastern Michigan U.)
- Red pigment could be blood or iron oxide
 - So can't just look for Fe
- Contamination makes PCR impossible
- Heme is relatively stable and could be used as a biomarker for blood

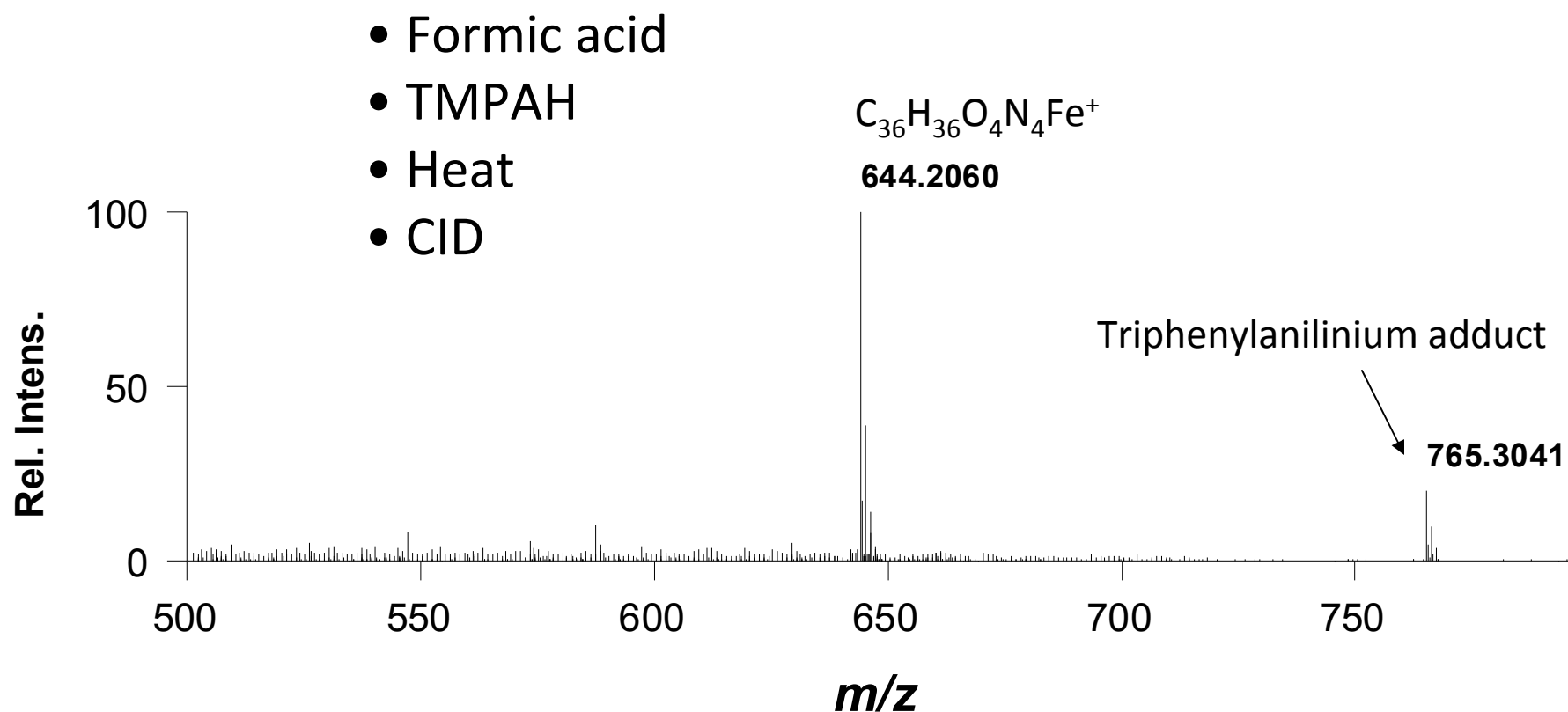
DART: Heme from Myoglobin



- Formic acid
- High gas temperature
- High cone voltage

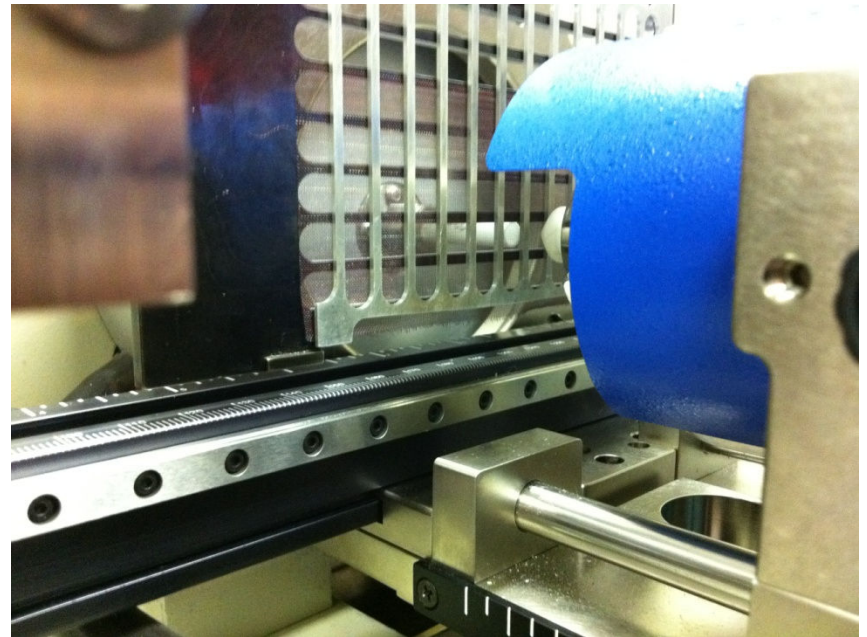


Permethylation of Acid Groups with TMPAH Improves S/N



DART X-Z Stage

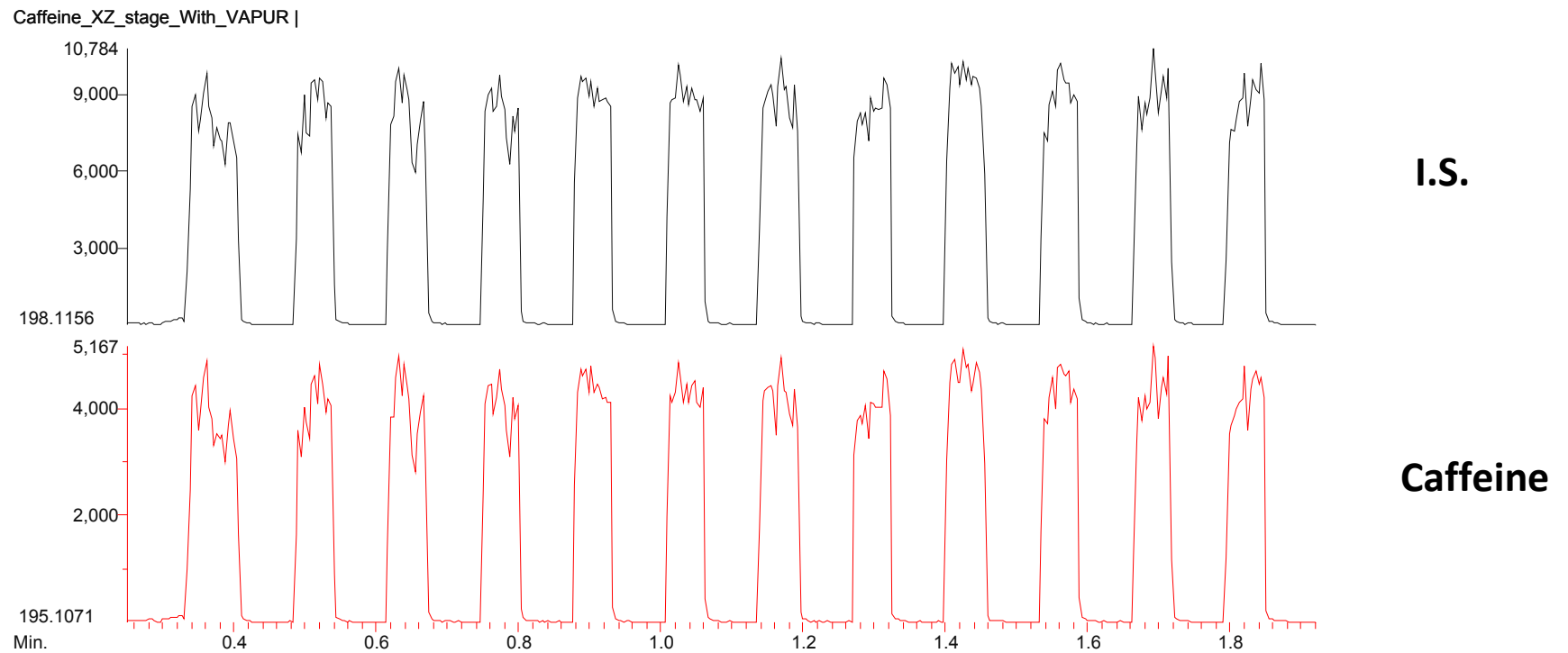
- Variation of linear rail transmission DART.
- Consists of 96 transmission spots oriented vertically and horizontally.
- Tested on JEOL AccuTOF system with the Vapur interface.



Elizabeth Crawford will discuss this stage more during her presentation.

DART X-Z Stage

- 2 trials of 12 replicates caffeine + internal standard



Good Reproducibility with X-Z Stage

Results on JEOL AccuTOF-DART system:

With I.S.

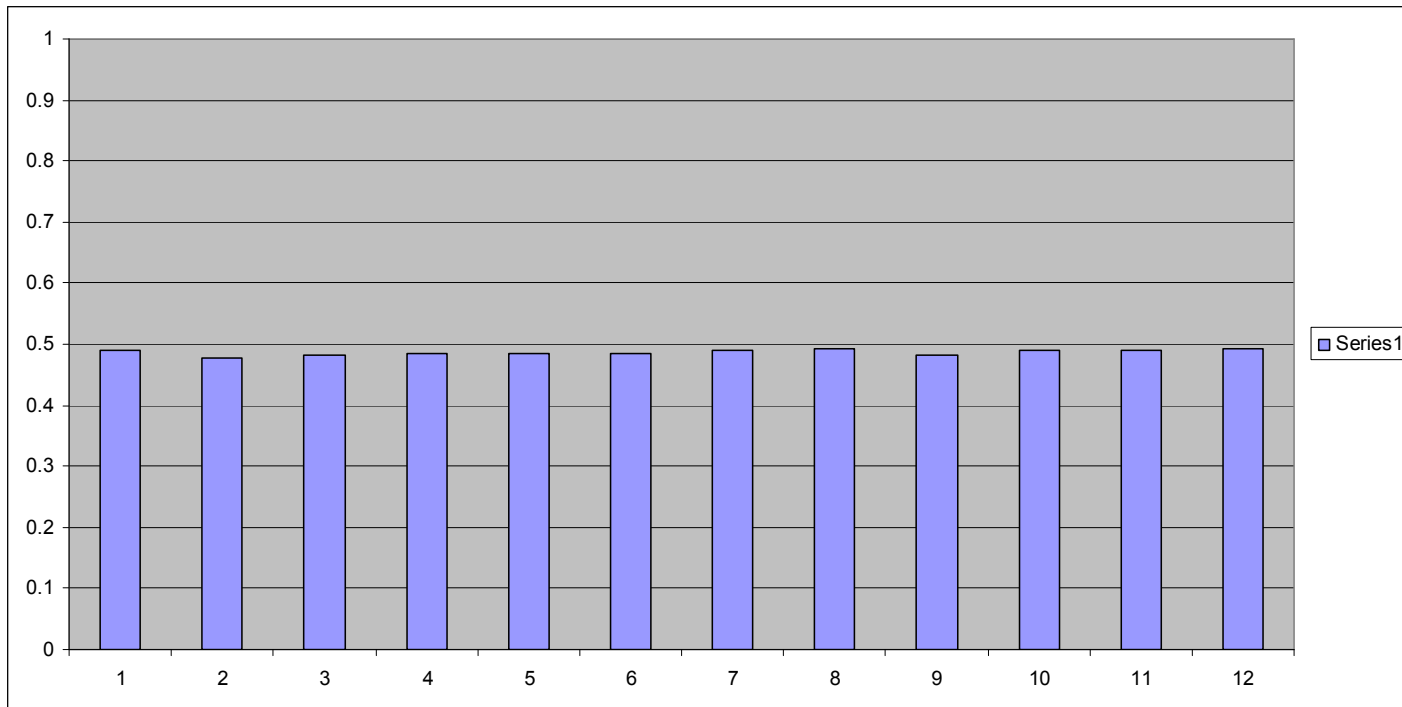
Trial 1 CV% = 0.9

Trial 2 CV% = 1.1

Without I.S.

m/z 195: CV% = 7.2

m/z 198: CV% = 6.9



Szechuan Buttons

- These flowers, often referred to as “Buzz Buttons”, are becoming popular for mixing into alcoholic beverages
- Causes a numbing of the tongue and throat in addition to the typical effects of alcohol
- Looked at them directly with DART to determine the active ingredients in the plant material

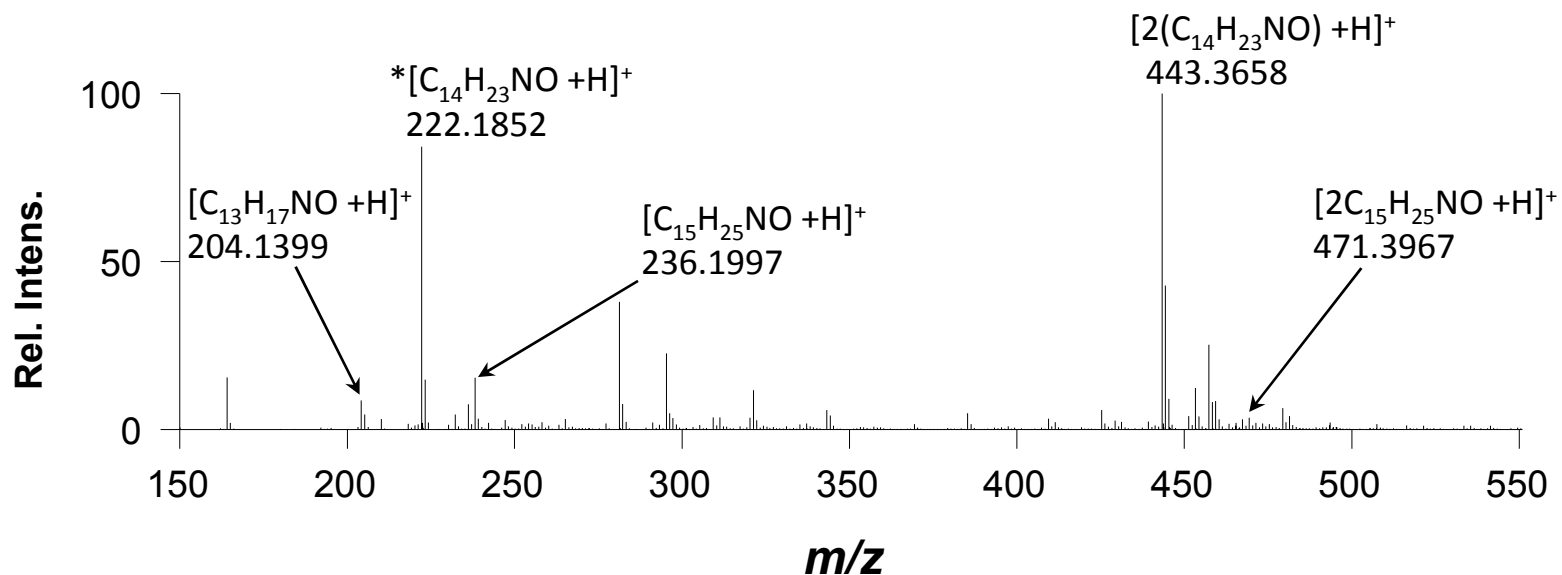


Acmella oleracea



Martini infused and garnished with buzz buttons

Buzz Buttons Results



<u>Name</u>	<u>Neutral comp.</u>
(Z)-non-2-en-6,8-diynoic acid isobutylamide	C13H17NO
(Z)-dec-2-en-6,8-diynoic acid isobutylamide	C14H19NO
Spilanthol	C14H23NO *
Methylbutyl amide	C15H25NO

- Spilanthol is the main active ingredient (dominant peaks) that causes the numbing sensation.
- All of these compounds were previously identified through methods using LC prior to analysis.

Thank You!