

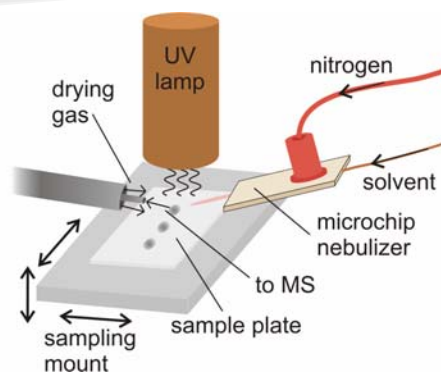
DAPPI-MS in drug analysis

19th Helsinki Drug Research 2008
Laura Luosujärvi

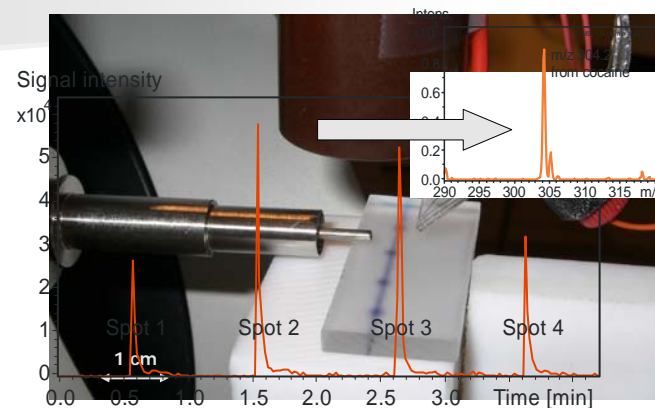
Overview

- Principle of DAPPI-MS
(Desorption Atmospheric Pressure
Photoionization-Mass Spectrometry)
- Factors affecting the DAPPI process
- Real-life applications

Schematic view of DAPPI-MS



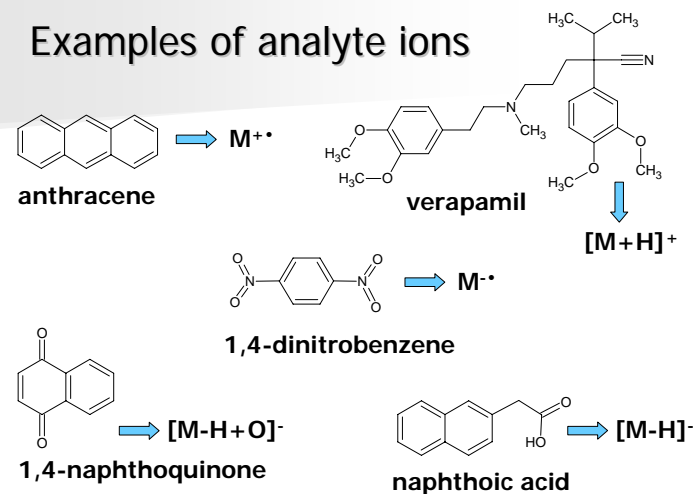
DAPPI-MS in practice



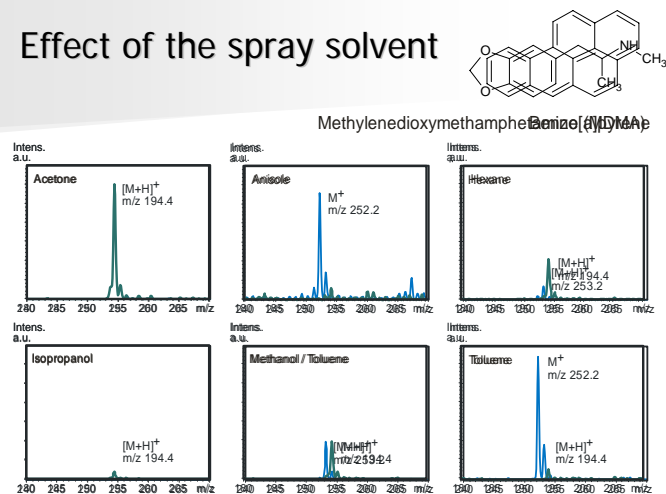
Ionization reactions

- 1) $S + h\nu \rightarrow S^{+\bullet} + e^-$ $E_{\text{photon}} = 10 \text{ eV}$
- 2) $S^{+\bullet} + M \rightarrow S + M^{+\bullet}$
- 3) $S^{+\bullet} + M \rightarrow [S-H]^{\bullet} + [M+H]^+$
- 4) $O_2 + e^- \rightarrow O_2^{\bullet-}$
- 5) $M + O_2^{\bullet-} \rightarrow M^{\bullet} + O_2$
- 6) $M + e^- \rightarrow M^{\bullet-}$
- 7) $M + O_2^{\bullet-} \rightarrow [M-H]^{\bullet-} + HO_2^{\bullet}$
- 8) $M + O_2^{\bullet-} \rightarrow [M-H+O]^{\bullet-} + OH^{\bullet}$

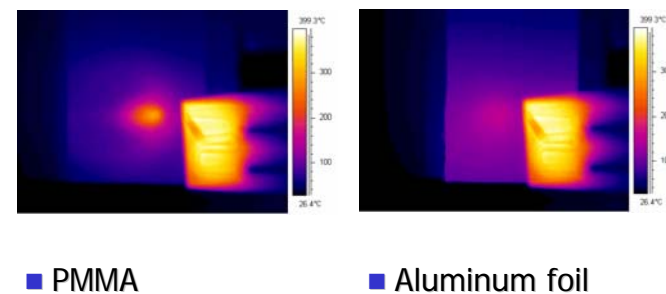
Examples of analyte ions



Effect of the spray solvent

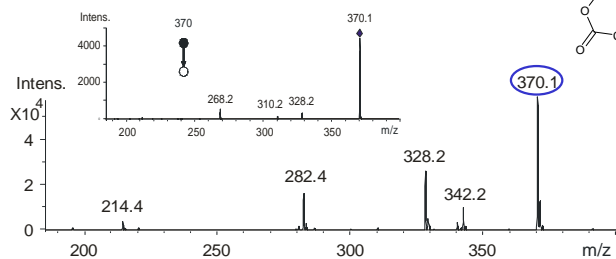
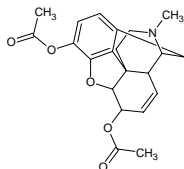


Sampling surface thermal conductivity



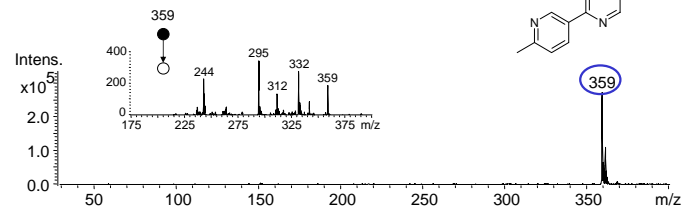
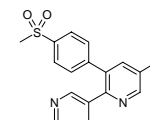
Heroin analysis by DAPPI-MS

- Heroin solution (1 μL of 10 $\mu\text{g}/\text{mL}$)
- Spray solvent: acetone



Tablet analysis by DAPPI-MS

- Arcoxia tablets (etoricoxib 120 mg)
- Spray solvent: acetone



Conclusions

- Suitable for small organic molecules
- Selectivity can be modified by spray solvent
- Analysis time a few seconds
- Compatible with any API-MS system

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