

STUDENT 8

ANALYSIS OF BENZODIAZEPINES: A COMPARATIVE STUDY OF ION TRAP LC-MSⁿ AND TRIPLE QUADRUPOLE LC-MS-MS

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Benzodiazepines are commonly prescribed drugs of interest to forensic toxicologists because they are frequently found in combination with other drugs in drug related fatalities. They are also abused and can be a factor in impaired driving, sexual assault and other crimes.

We have investigated LC-MS screening methods to simultaneously identify 22 benzodiazepines and metabolites with 3 non-benzodiazepines of forensic interest (zolpidem, zopiclone and flumazenil) on the Agilent Technologies LC-MSⁿ Ion-Trap and Waters Micromass LC-MS-MS Triple Quadrupole.

As part of this process we have investigated the fragmentation pathways of the drugs with electrospray ionisation coupled with an ion trap mass spectrometer to the MS⁴ and on a triple quadrupole mass spectrometer to MS². A number of the benzodiazepines had neutral losses in common as a result of the collision induced dissociation process.

A comparison of LC/MS/MS for the analysis of 11 benzodiazepines in biological samples by an ion trap and a triple quadrupole mass spectrometer was made. While the triple quadrupole produced superior results, the ion trap was also suitable for these analyses.