PW2 A cost effective analysis of dialkylphosphates in urine by negative ion chemical ionization ion trap gas chromatography /mass spectrometry-mass spectrometry

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A GC/Ion Trap MS-MS method for the analysis of OP metabolites has been developed.

The instrumental conditions of low ppb level analysis of 6 dialkyl phosphates (DAPs), metabolites of organophosphorus insecticides: dimethyl phosphate (DMP), dimethyl thiophosphate (DMTP), dimethyl dithiophosphate (DMDTP), diethyl phosphate (DEP), diethyl thiophosphate (DETP), diethyl dithiophosphate (DEDTP) in human urine using ion trap (IT) GC/MS-MS technique has been described. The applicability of IT MS-MS detector (Thermo Finnigan MAT *CGQ Plus*) in negative ions chemical ionisation (NICI) mode for the DAP analysis was evaluated and compared with that of the triple stage quadrupole (TSQ) analyser. The collision induced dissociation (CID) of dimethyl thio- and dithiophosphates in IT was different to that earlier observed in the linear configuration analyser [1]. The CID of methyl derivatives leaded to formation of protonated and non-protonated inorganic thio- and dithiophosphate ions. It was found that fragmentation of pentafluorobenzyl DAP derivatives is most sensitive to changes of collision energy and the *q* parameter of the IT. The calibration curves were linear for DMP up to 500 ppb, DEP up to 250 ppb and DMTP, DMDTP, DETP and DEDTP up to 100 ppb. The limit of quantitation was estimated at DMP 5.0 ppb, DEDTP 2.0 ppb and 0.5 ppb for other analytes and were comparable to that of the TSQ analyser.

[1] A. Oglobline, H. Elimelakh, B. Tattam and G. Holder, GC/MS/MS analysis of urinary metabolites of organophosphorus pesticides. 17th ANZSMS conference, Thredbo Alpine Village, 1 - 4 February, 1999, Australia.