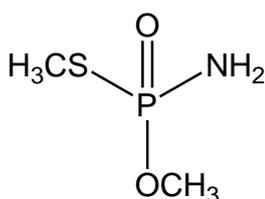


Analysis of Methamidophos and Acephate in Tea by LC-MS/MS

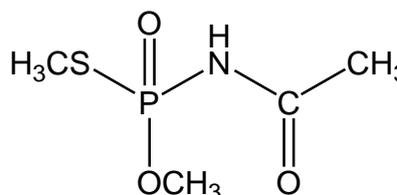
Methamidophos is an organophosphate insecticide that has been banned for use in Japan. Through the Positive List System, the Ministry of Health Labour and Welfare has advised that GC should be used as the method for analyzing methamidophos. However, as methamidophos has a polar structure similar to acephate, this compound is not readily applicable to GC analysis.

Here, methamidophos and acephate were simultaneously analyzed using a simulated sample created by adding standard substances to tea. Analysis was performed after first removing highly hydrophobic foreign matter in a two-stage solid-phase extraction process conducted as a pretreatment process. In this process, recovery rates of $\geq 75\%$ were achieved for added analytes. Both components showed good linearity in a concentration range of 0.5 to 50ppb.

Figure 1. Structural formulas



Methamidophos



Acephate

Table 1. Analytical conditions

Column:	TSKgel ODS-100V, 3 μ m, 2.0mm ID x 15cm
Mobile phase:	A: water, B: acetonitrile A/B = 95/5
Flow rate:	0.2mL/min
Temperature:	40°C
Injection vol.:	5 μ L
Instrument:	Agilent 1200SL series QTRAP (MDS SCIEX)
Ion Source:	ESI (Positive) m/z – 142>94 (Methamidophos), 184>143 (Acephate)

Figure 2. Chromatogram of methamidophos and acephate (5ppb)

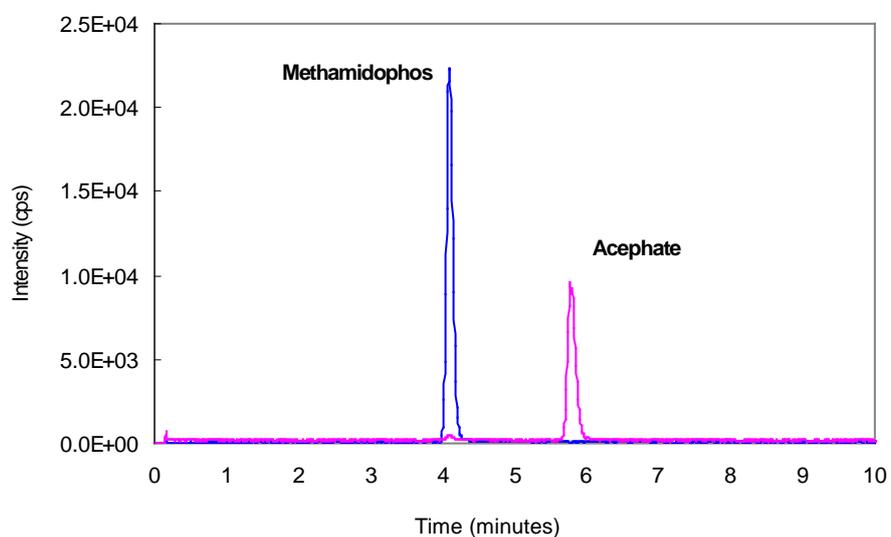


Figure 3. Pretreatment of samples

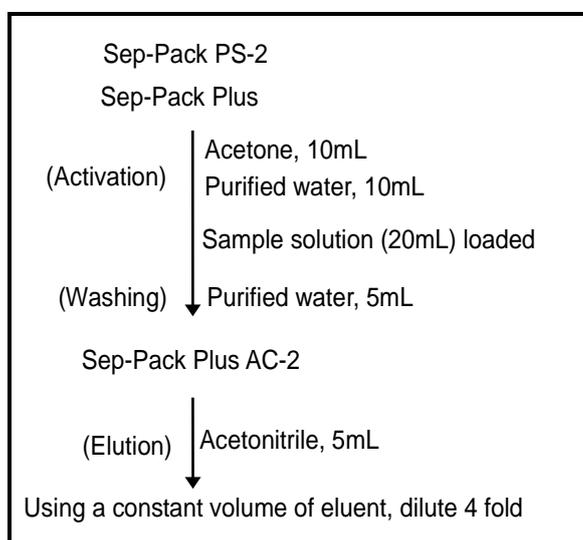
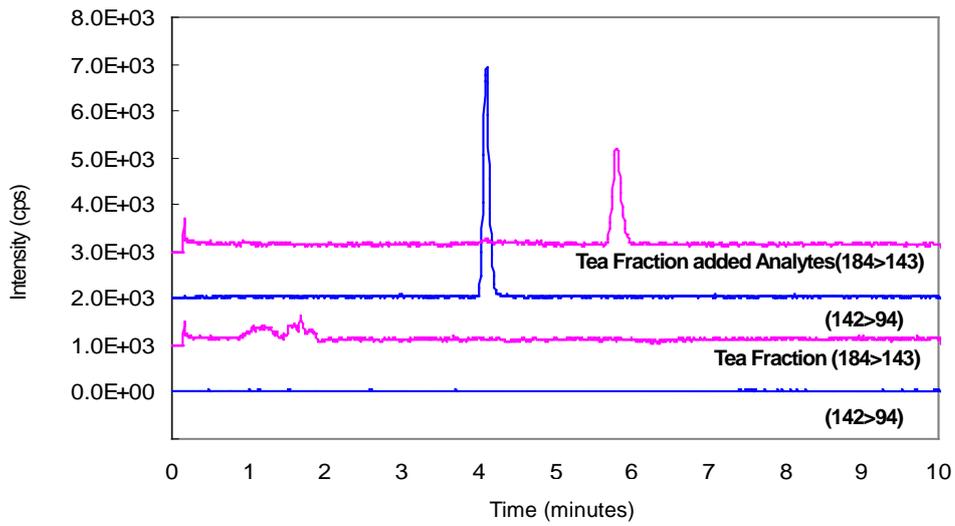


Figure 4. Chromatograms of tea and tea with added analytes (1ppb)



TOSOH

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