

**Spray-inlet microwave plasma torch and low temperature
plasma ionization for ambient mass spectrometry of
agrochemicals**

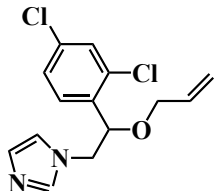
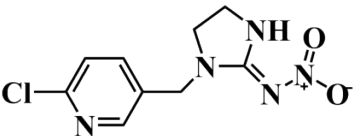
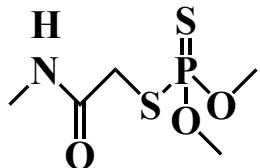
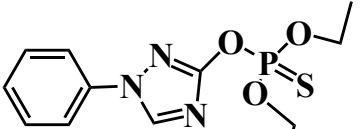
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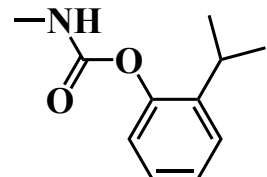
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Table S1 Characteristics of the selected pesticides from the results of MS analysis of the reference substances

Analyte and Molecular structure	MW ¹	TPSA ²	Major ions observed with MPT-Ar relative abundance/assignment	Major ions observed with LTP-He relative abundance/assignment	Major ions observed with ESI relative abundance/assignment
Chlorpyrifos	351	73	352 (100%) [M+H] ⁺	352 (100%) [M+H] ⁺ 374 (34%) [M+Na] ⁺	352 (100%) [M+H] ⁺ 374(97%) [M+Na] ⁺ 390 (65%) [M+K] ⁺
Diphenylamine	169	12	170 (100%) [M+H] ⁺	170 (100%) [M+H] ⁺	NA ³
Atrazine	215	63	216 (100%) [M+H] ⁺ 174 (72%) [M-C ₃ H ₅] ⁺	216 (100%) [M+H] ⁺	216 (100%) [M+H] ⁺

Imazalil 	297	27	298 (100%) [M+H] ⁺	298 (100%) [M+H] ⁺	298 (100%) [M+H] ⁺
Imidacloprid 	255	86.3	256 (81%) [M+H] ⁺ 175 (47%) [M-NO ₂ Cl+H] ⁺ 278 (82%) [M+Na] ⁺ 288 (100%) [M+H+CH ₃ OH] ⁺ 209 (41%) [M-NO ₂] ⁺	256 (67%) [M+H] ⁺ 175 (36%) [M-NO ₂ Cl+H] ⁺ 278 (92%) [M+Na] ⁺ 288 (100%) [M+H+CH ₃ OH] ⁺ 209 (32%) [M-NO ₂] ⁺	256 (50%) [M+H] ⁺ 274 (100%) [M+H ₃ O] ⁺ 278 (54%) [M+Na] ⁺ 288 (93%) [M+H+CH ₃ OH] ⁺
Dimethoate 	229	105	230 (43%) [M+H] ⁺ 252 (62%) [M+Na] ⁺ 284 (83%) [M+Na+CH ₃ OH] ⁺ 199 (100%) [M-CH ₄ N] ⁺ 171 (89%) [M-C ₂ H ₄ NO] ⁺ 157 (95%) [M-C ₃ H ₆ NO] ⁺	230 (51%) [M+H] ⁺ 252 (41%) [M+Na] ⁺ 284 (49%) [M+Na+CH ₃ OH] ⁺ 199 (100%) [M-CH ₄ N] ⁺ 171 (82%) [M-C ₂ H ₄ NO] ⁺ 157 (66%) [M-C ₃ H ₆ NO] ⁺	230 (32%) [M+H] ⁺ 252 (92%) [M+Na] ⁺ 270 (51%) [M+H ₂ O+Na] ⁺ 284 (100%) [M+Na+CH ₃ OH] ⁺ 199 (81%) [M-CH ₄ N] ⁺ 171 (67%) [M-C ₂ H ₄ NO] ⁺ 157 (59%) [M-C ₃ H ₆ NO] ⁺
Triazophos 	313	90.5	314 (100%) [M+H] ⁺	314 (100%) [M+H] ⁺	314 (100%) [M+H] ⁺ 368 (65%) [M+CH ₃ OH+Na] ⁺

Isoprocab	193	38	194 (100%) [M+H] ⁺	194 (100%) [M+H] ⁺	194 (100%) [M+H] ⁺
			137 (55%) [M-C ₂ H ₂ NO] ⁺	137 (31%) [M-C ₂ H ₂ NO] ⁺	137 (39%) [M-C ₂ H ₂ NO] ⁺
			152 (63%) [M-C ₃ H ₅] ⁺		
			184 (55%) [M-C ₃ H ₅ +CH ₃ OH] ⁺		

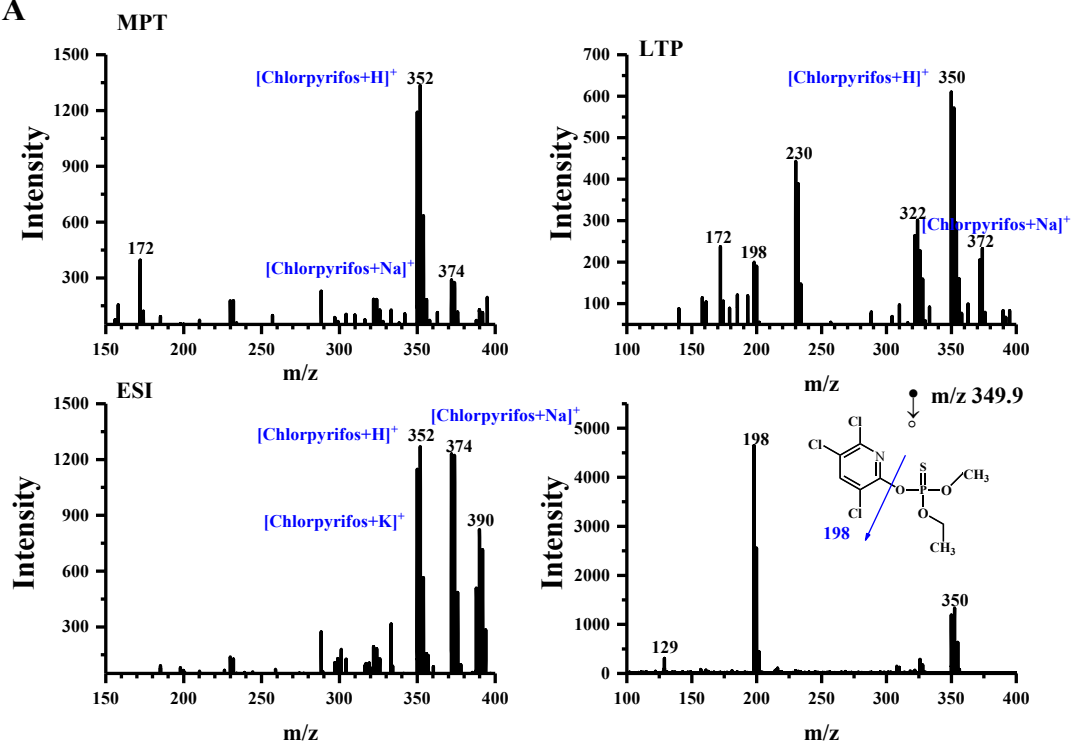
WM¹: Molecular Weight

TPSA²: Topological molecular polar surface area

NA³: Not available.

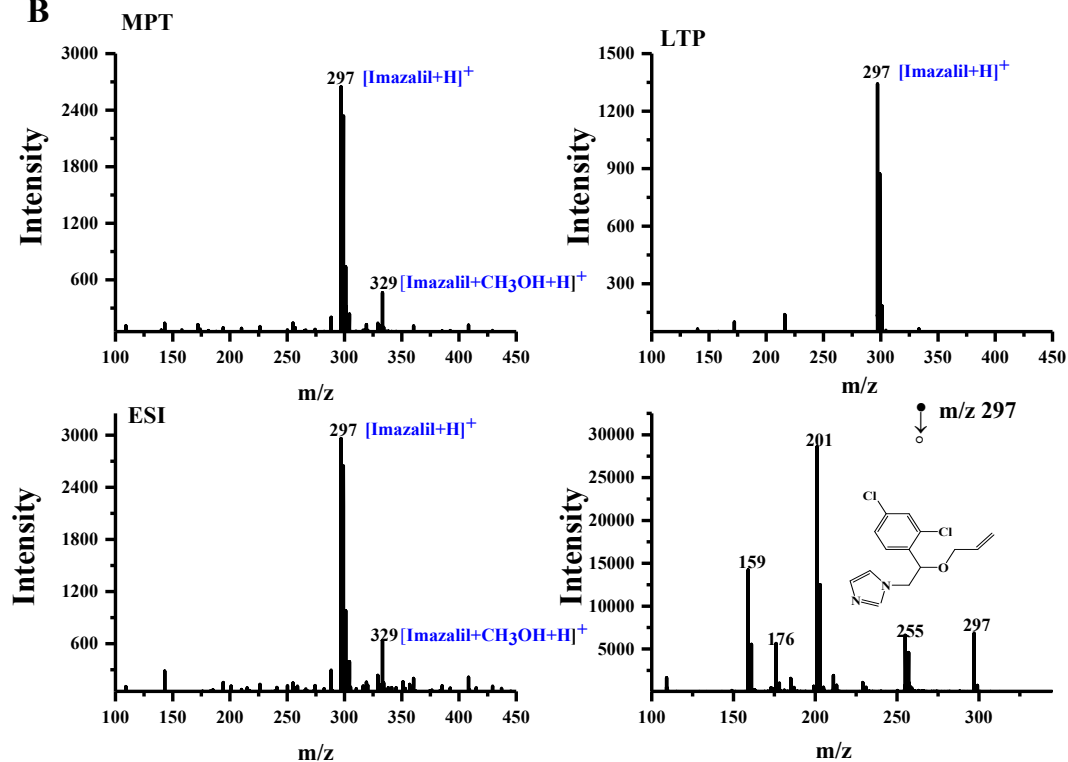
Chlorpyrifos

A



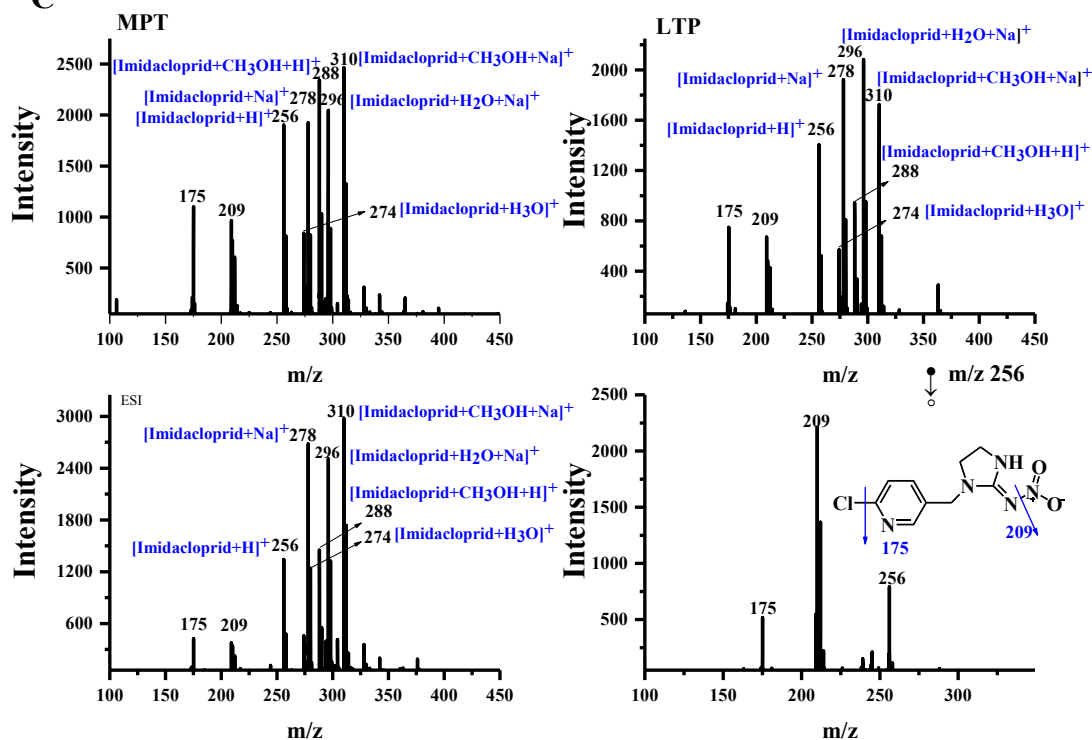
Imazalil

B



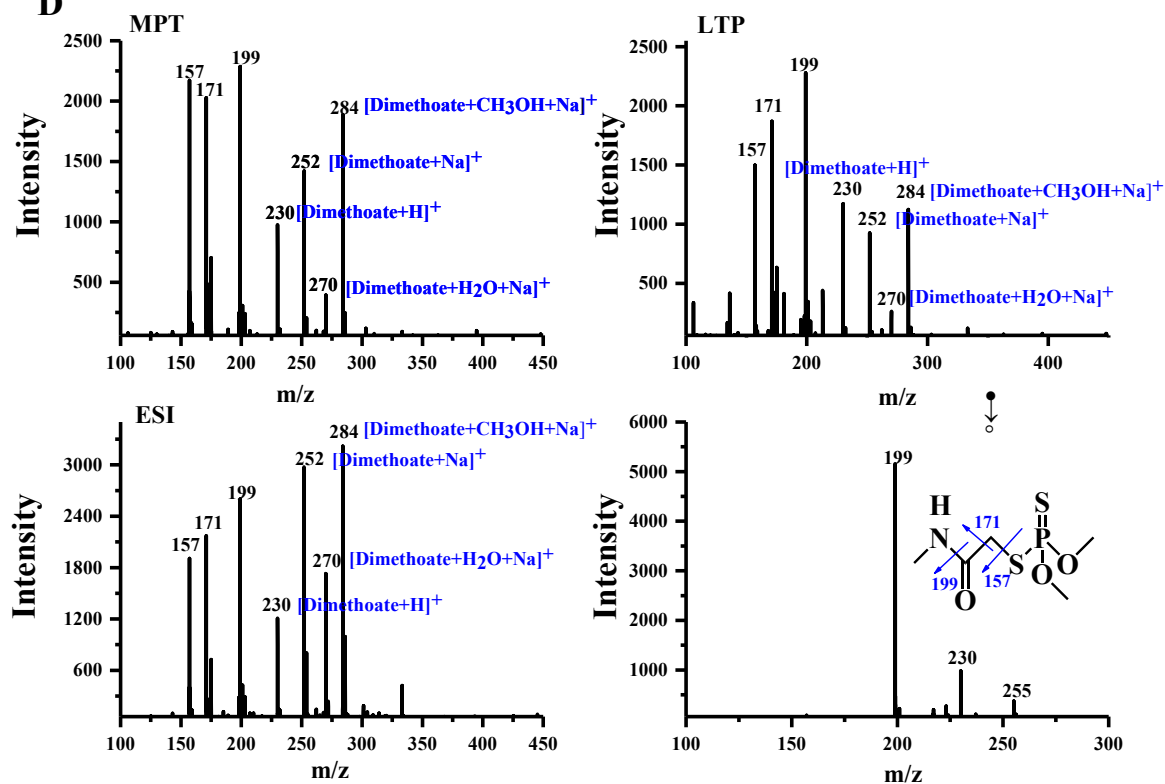
Imidacloprid

C



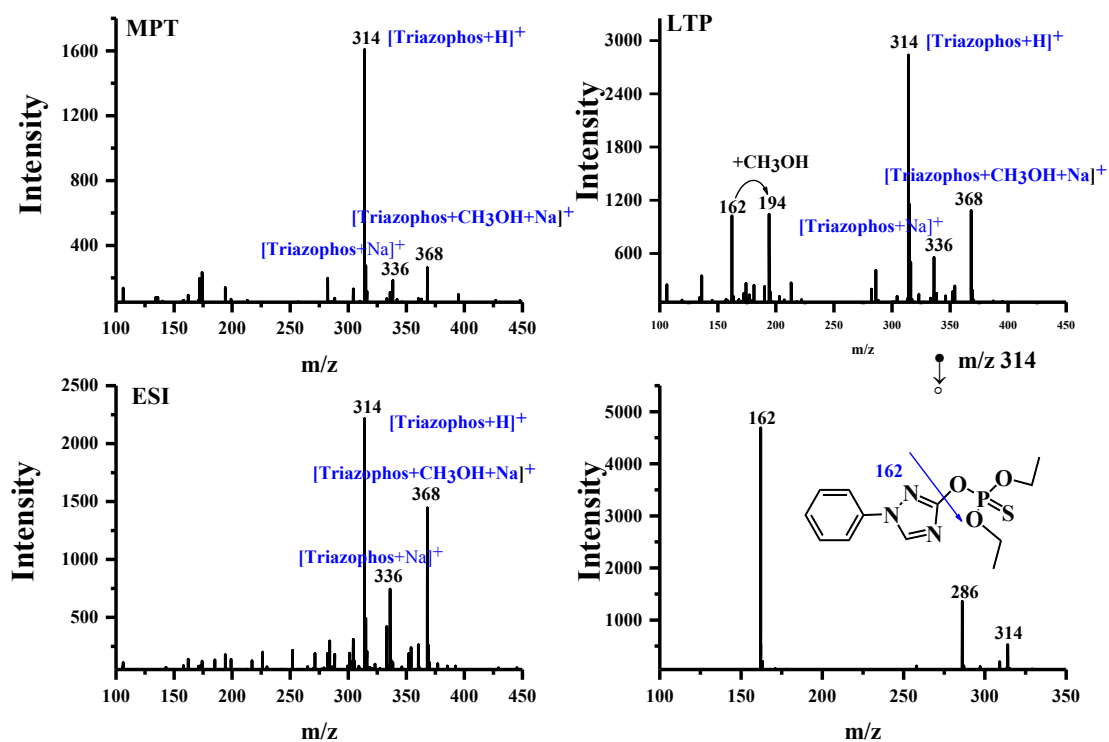
Dimethoate

D



Triazophos

E



Isoprocarb

F

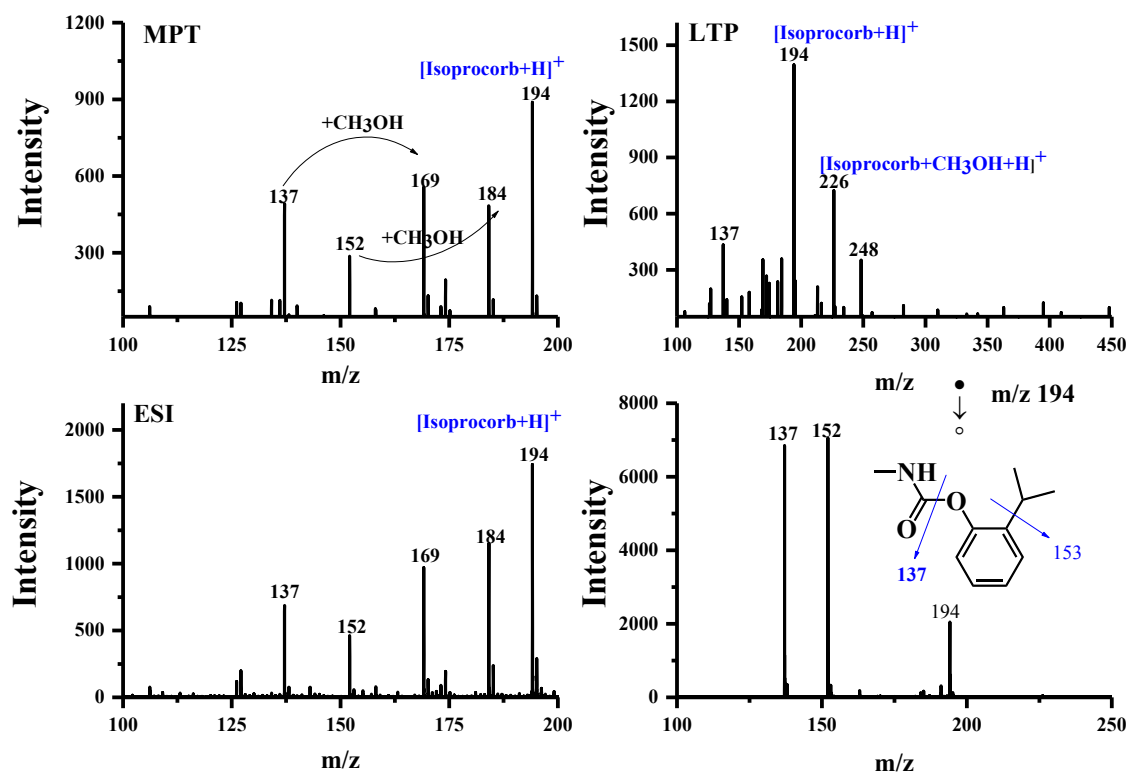


Figure S1. Mass spectra of protonated (A) chlorpyrifos (m/z 349.9), (B) imazalil (m/z 297), (C) imidacloprid (m/z 256), (D) dimethoate (m/z 230), (E) triazophos (m/z 314) and (F) isoprocarb (m/z 194), and the CID spectra of chlorpyrifos (m/z 129, 197), imazalil (m/z 159, 176, 201, 255), imidacloprid (m/z 175, 210), (D) dimethoate (m/z 199), (E) triazophos (m/z 162, 286) and (F) isoprocarb (m/z 137, 153) in the positive mode. The power and microwave frequency of MPT source were 20 W and 2.45 GHz, respectively, with the He flow rate of 800 ml/min, and of LPT source were 15W and 8.5 KHz at 7KV, respectively, with the He flow rate of 300 ml/min. The voltage of ESI source was +5000V, and pressure of carrier gas (N_2) was 60 psi.

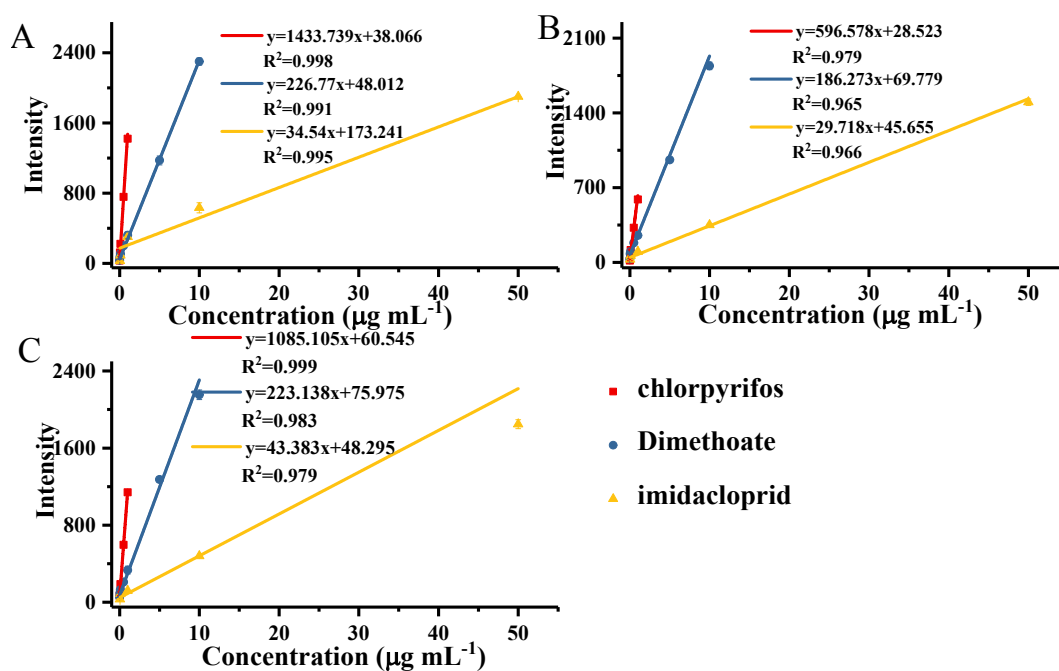


Figure S2 Calibration curves of chlorpyrifos, dimethoate and imidacloprid for standard solution by using MPT ion source (A), LTP ion source (B) and ESI ion source (C) respectively.