



3.3 Analysis of Capsaicin Using NCI-GC/MS (1) - GCMS

•Explanation

Capsaicin, that gives red pepper its "hot" flavor, was analyzed using the electron impact ionization method (EI), the positive chemical ionization method (PCI) and the negative chemical ionization method (NCI).

The EI method shown in Figs. 3.3.1 and 3.3.2 revealed fragment ions. The PCI method shown in Fig. 3.3.3 revealed a proton-added quasi-molecular ion peak (m/z 306) as the base peak. And the NCI method shown in Fig. 3.3.4 revealed that higher-sensitive detection was possible in comparison with the other ionization methods. Figs. 3.3.5, 3.3.6, 3.3.7 and 3.3.8 show measurement results for red pepper extract using EI, PCI and NCI methods. The reaction gases methane and ammonia were used for measurement with the NCI method.

•Analytical Conditions

Instrument	: GCMS-QP5050A
— GC —	
Column	: DB - 5 (30m $\times$ 0.32mm i.d. df=0.25 μ m)
Column Temp.	: 60°C (1min) - 10°C/min - 280°C (20min)
Injector Temp.	: 280°C
Carrier gas	: He 100kPa
Injection Method	: Splitless (Sampling Time=2min)
— MS —	
Interface Temp.	: 250°C
Ionization Method	: EI, PCI, NCI
Scan Range	: m/z 35-600 (EI) m/z 70-600 (PCI, NCI)
Scan Interval	: 0.5sec

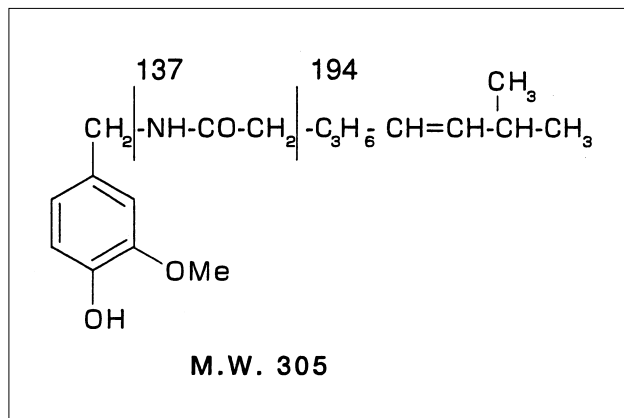


Fig. 3.3.1 Capsaicin structure

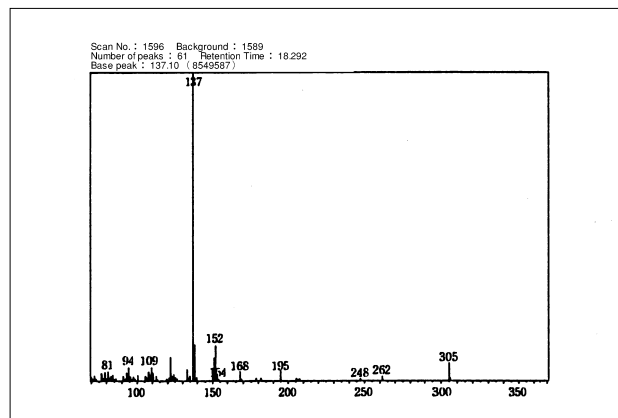


Fig. 3.3.2 EI mass spectrum of capsaicin

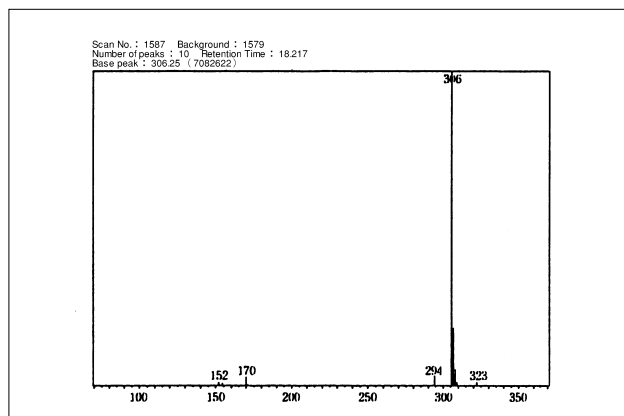


Fig. 3.3.3 PCI mass spectrum of capsaicin

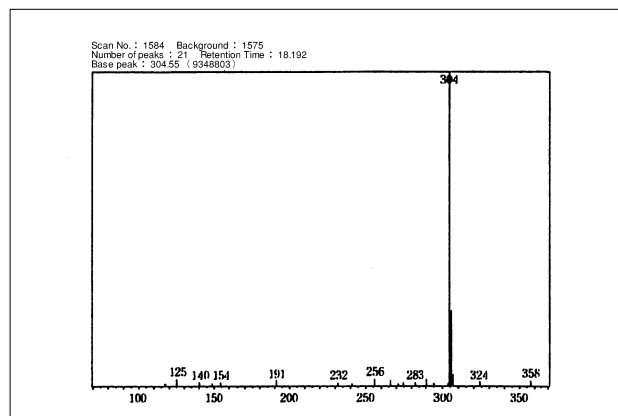


Fig. 3.3.4 NCI mass spectrum of capsaicin

3.3 Analysis of Capsaicin Using NCI-GC/MS (2)- GCMS

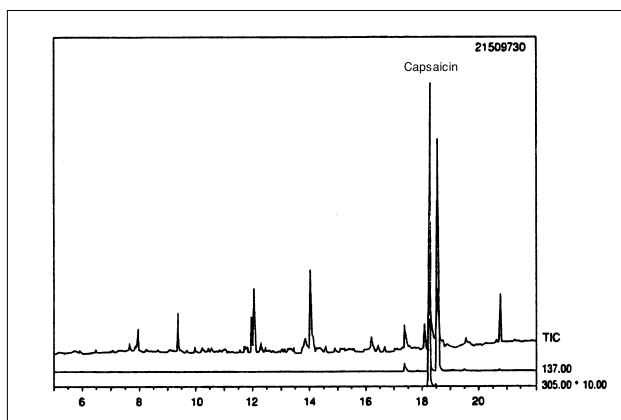


Fig. 3.3.5 Mass chromatogram of red pepper extract (EI method)

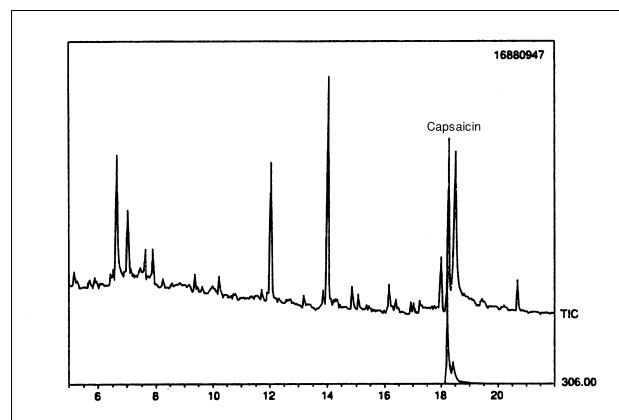


Fig. 3.3.6 Mass chromatogram of red pepper extract (PCI method)

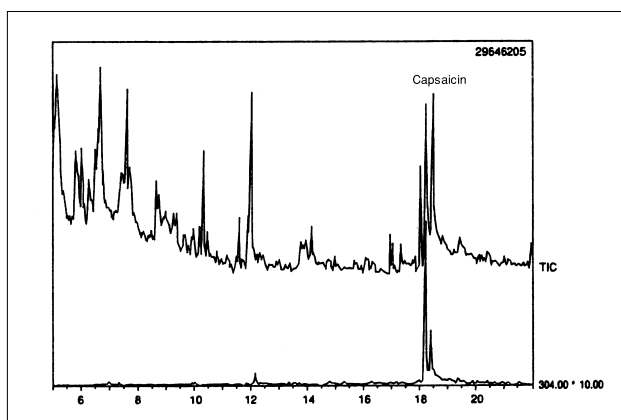


Fig. 3.3.7 Mass chromatogram of red pepper extract (NCI method: methane reaction gas)

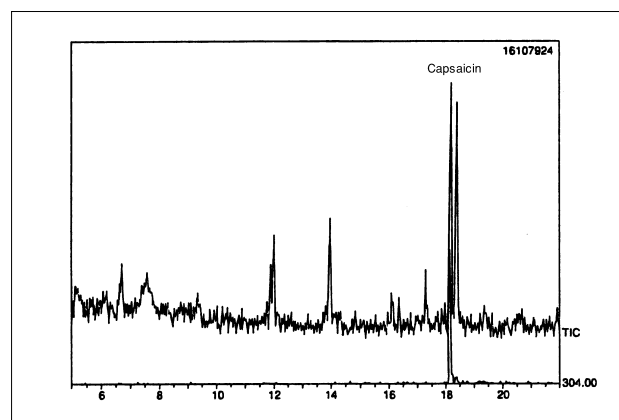


Fig. 3.3.8 Mass chromatogram of red pepper extract (NCI method: ammonia reaction gas)