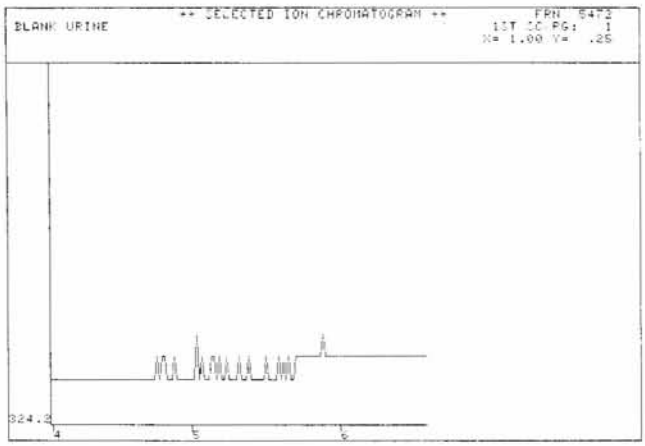

Figure 8c. Unspiked urine run under the same conditions as (b).

LC/MS Analysis in Forensic Studies. Analysis of Extract of Cannabis Leaves

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This report describes the LC/MS analysis (70) of the benzene extract of dried leaves of Cannabis (87) and illustrates how LC/MS provides a convenient means of analyzing the extract without any derivatization steps. The dried leaves were finely divided and immersed in pure benzene. The sample was drawn directly from the solution and 1 μl was injected on a reversed-phase column (μBondapak-C_{18}, 5 μm) connected online to a prototype DLI interface "Carole," which has been described elsewhere (88). The complete LC/MS system consists of a Waters (Milford, Massachusetts) HPLC pump, Model 6000A, a Waters loop injector, a Nermag (Rueil-Malmaison, France) Model 10-10-B quadrupole mass spectrometer equipped with a DLI interface, and a SIDAR data acquisition system.

The solvent for HPLC and chemical ionization was acetonitrile adjusted to a flow of 1 ml/min through the HPLC column. The output effluent was split and injected through the DLI via a thin metallic diaphragm which allowed the penetration of about 40 μl/min of liquid solution into the mass spectrometer. The MS source block pressure was 0.15 Torr, as read from a thermocouple gauge directly attached to the ion source block, and the source block temperature was 150°C. The other conditions are similar to those described previously (70,87).

The reconstructed liquid chromatogram (RLC) is given in Figure 9 and three mass spectra corresponding to peaks labelled 1, 2, and 3 on the RLC are shown in Figure 10. No particular effort was made to optimize the separation. Peak 1 was not identified, peak 2 was cannabinol (MW 310), and peak 3 was a mixture of two isomers, cannabinol and tetrahydrocannabinol (MW 314). The later eluting chromatographic peaks were not investigated. Although peaks 2 and 3 overlap on the RLC, they could be displayed separately by plotting the mass chromatograms corresponding to the M + 1 ions.

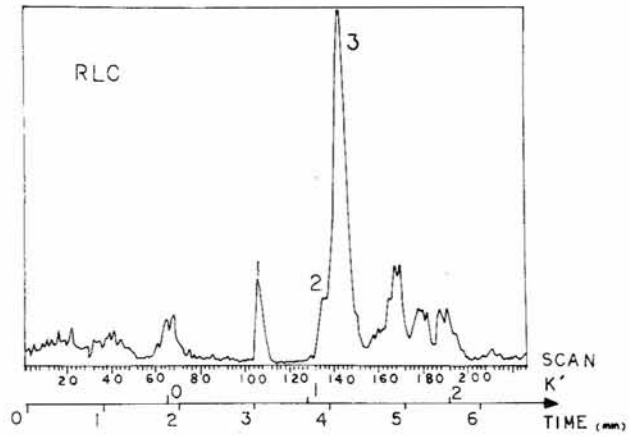

Figure 9. Total ion current chromatogram (RLC) from LC/MS analysis of Cannabis leaf extract. Column, μBondapak-C18, 5 μm; solvent acetonitrile, 1 ml/min.

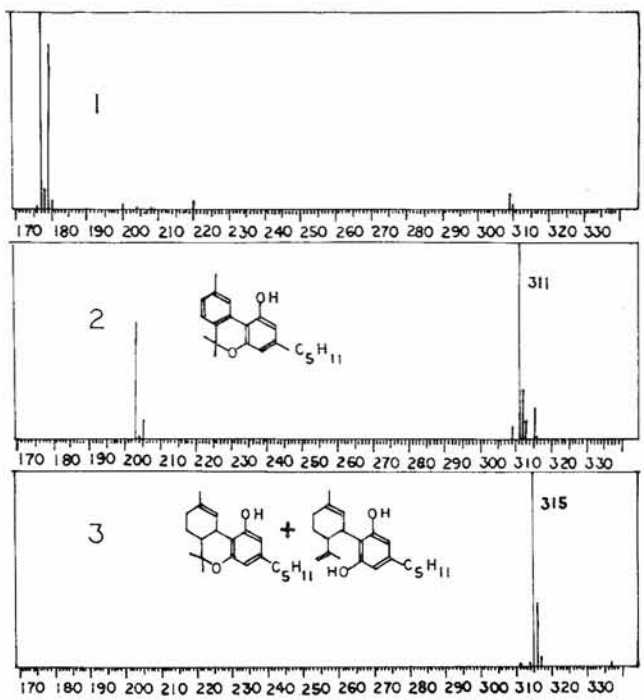

Figure 10. Chemical ionization mass spectra corresponding to peaks 1, 2, and 3 in Figure 9.

Applications of LC/MS Techniques to the Analysis of Liquid Crystal Mixtures

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Organic compounds exhibiting liquid crystalline properties and behavior have been the subject of considerable study in recent years. Such compounds, either as high purity single components, or more usually, as multi-component mixtures, have found extensive applications in optoelectronic devices, defectoscopy, medicine, and analytical chemistry (89,90). Useful mixtures may contain compounds from one homologous series and/or from members of different structural classes. Such mixtures are difficult to separate by