

## Analysis of Tetracyclines

Tetracycline derivatives such as oxytetracycline (OTC), chlortetracycline (CTC), and tetracycline are antibiotics that are now most widely used for marine products and livestock. But in accordance with the increase of their use in the said fields, their influence to human body and environmental pollutions have come to be taken up as a subject of grave public concern. Accordingly, it is necessary to measure residual amount of these antibiotics in marine products and in livestock.

By using a high performance liquid chromatograph, it is possible to analyze all these tetracycline derivatives at a time. So HPLC is considered to be a very effective means of analysis for the said purpose. Introduced here is a high sensitivity analytical method using the chelate formation with magnesium ions.

### ■ Separation and Detection of Tetracycline Derivatives

Generally, separation of tetracycline derivatives is conducted by reversed phase chromatography, but the problem is that tetracyclines are apt to form chelate with metal ions such as ion of iron provided in the stationary phase. For this reason, it is necessary to reduce the formation of chelate. In the example of analysis introduced here magnesium ions were added to a mobile phase conversely, being separated as chelate and presenting solution to the above problem.

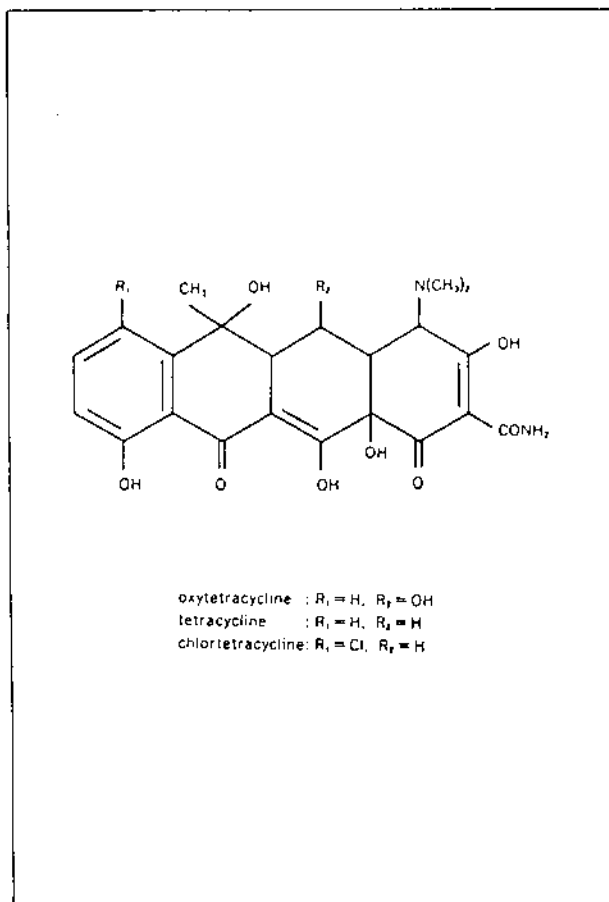


Fig. 1 Chemical Structure of Tetracycline Derivatives

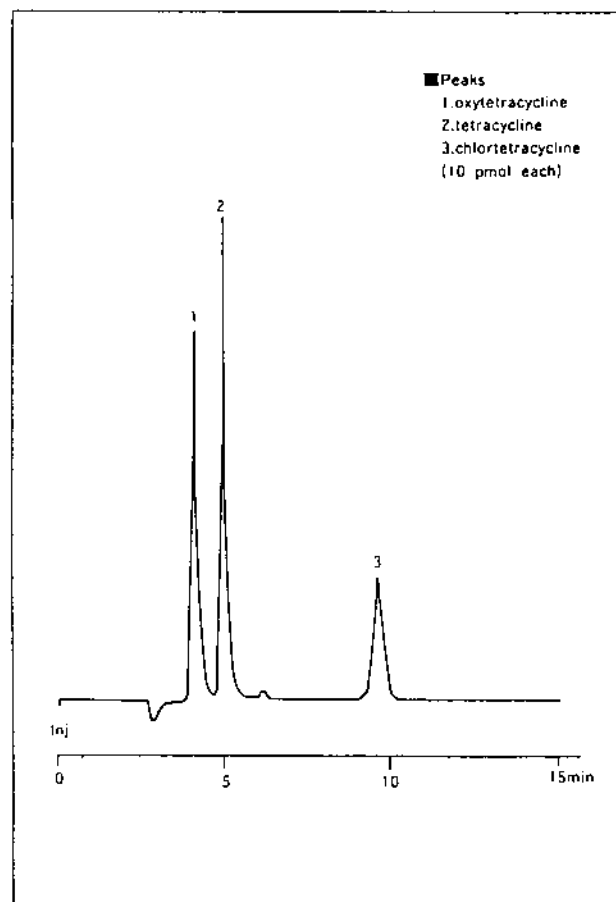


Fig. 2 Example of Analysis of Standard Substances

## ■ Pretreatment of Tetracycline Derivatives

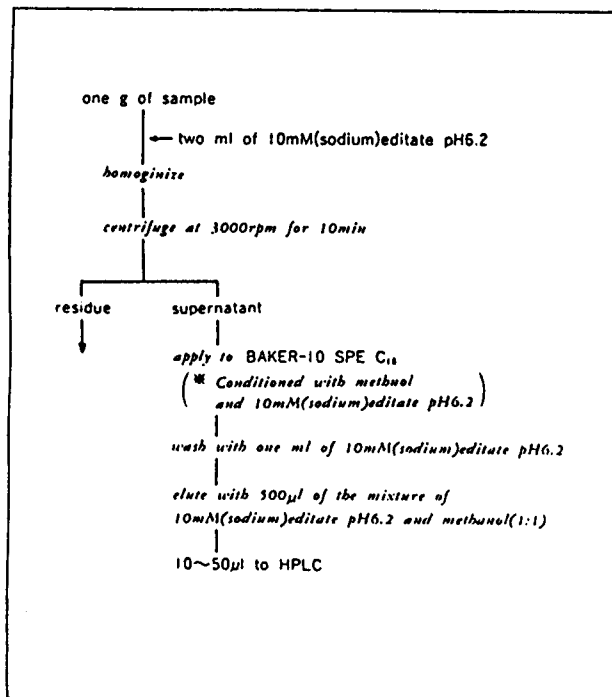


Fig. 3 Pretreatment of a Sample

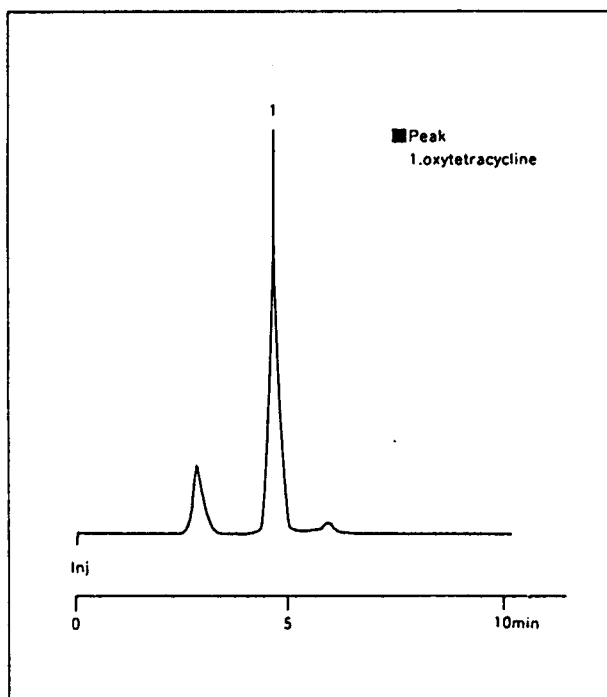


Fig. 4 Analysis of Liver of Swine

## ■ Analysis by Automatic Sample Pretreatment Analytical System

By the automatic sample pretreatment analytical system, extraction and concentration of tetracyclines are automated, doing away with a cumbersome operation of the instrument in sample pretreatment. All the operator has to do is to homogenize a sample immediately to remove insoluble substances and take supernatant fluid and inject it to the device directly.

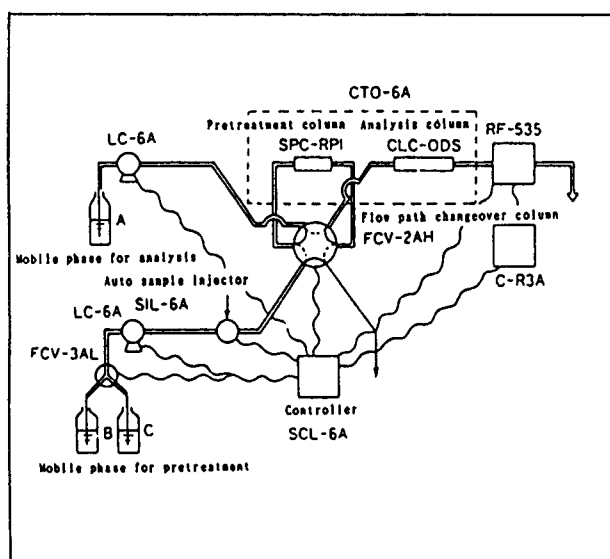


Fig. 5 Flow Diagram of Analysis System

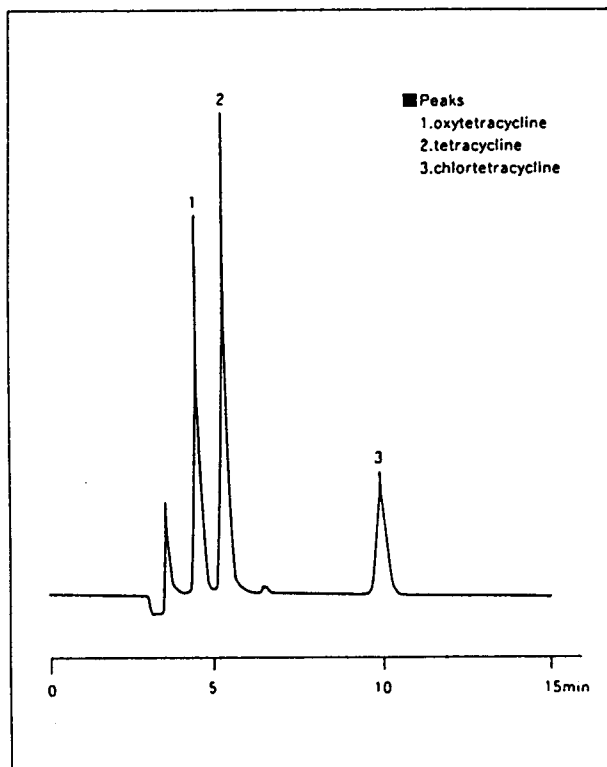


Fig. 6 Analysis of Meat

Note: In the analysis shown in Fig. 4 and 6, standard substances were added preliminarily before measurement.



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