

SHIMADZU APPLICATION NEWS

HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

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Application to Food Analysis (10)

— Measurement of Freshness of Meat ... Application to K Value Measurement —

In the eating habit in Japan, raw meat, and especially raw fish and shellfish are indispensable. Fresh fish rots very quickly, and freshness determines the taste. It is therefore essential in quality control to evaluate the freshness quantitatively. There are several scales of freshness, and the K value (freshness constant) is known to be suited for expressing the initial freshness, that is, "freshness off the fishing hook."

The K value is determined by measuring the absorbance of six ingredients contained in fish and shellfish—hypoxanthine (Hx), inosin (HxR), inosinic acid (IMP), adenosin monophosphate (AMP), adenosin diphosphate (ADP) and adenosin triphosphate (ATP) --- at the wavelength of 250 nm, and calculated from the formula shown in Fig. 1. For batch analysis of these ingredients, the high performance liquid chromatography is ideal, and its application examples are shown here.

■ Separation of Standard Specimen

Fig. 1 shows a chromatogram of a standard solution. For separation, a reverse phase chromatography is used. After detecting the ingredients, the K value is calculated from the individual peak areas.

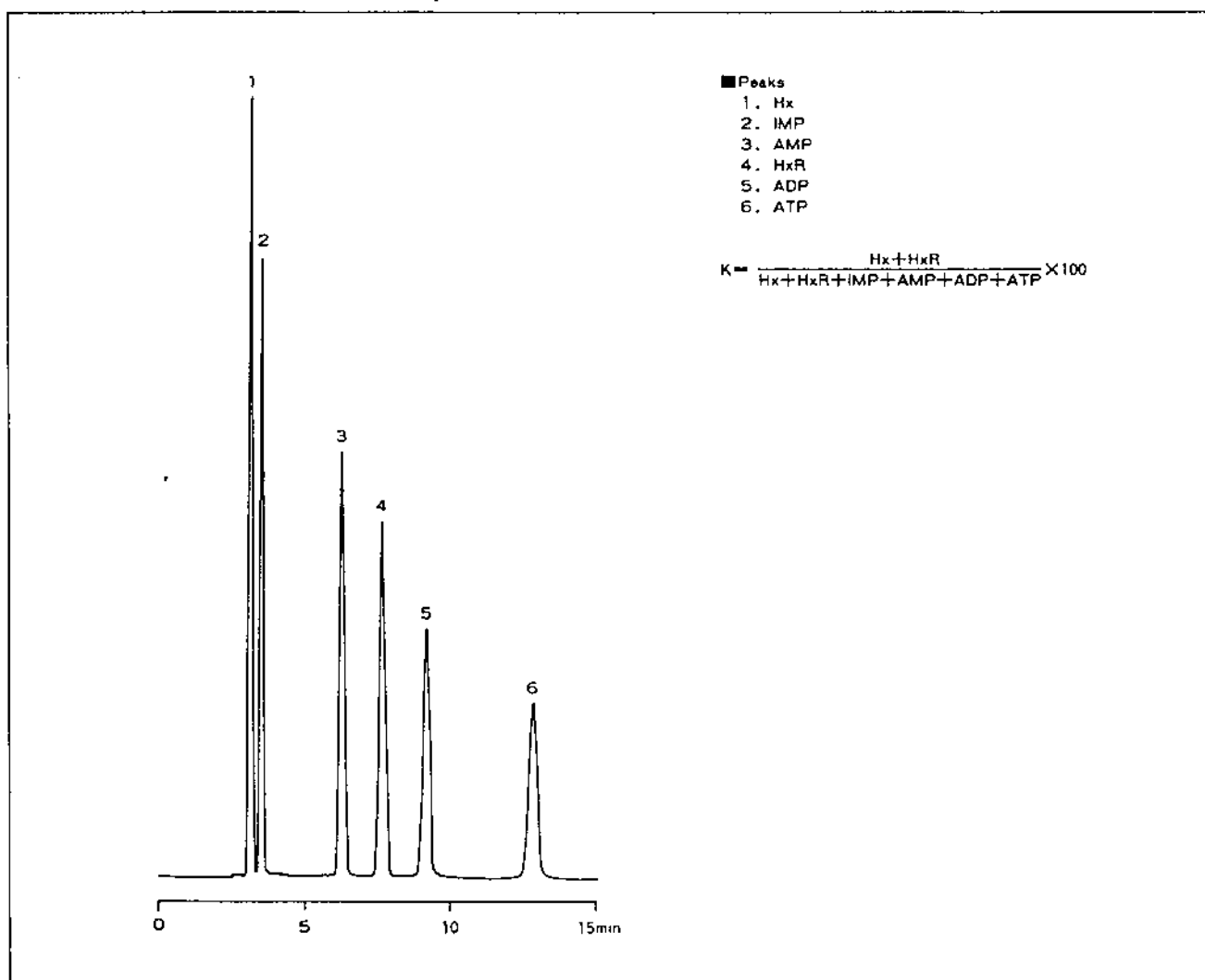


Fig. 1 Chromatogram of Standard Solution and Formula of K Value

■ Pretreatment of Sample

Pretreatment of sample is specifically explained in page 208 of "Food sanitary inspection guideline II, classified by foods, 1978" edited by Environment and Sanitation Bureau of Ministry of Health and Welfare of Japan (published by Japan Food Sanitation Association). The method of pretreatment is, however, slightly modified here to that the treated solution may not affect the state of separation. This method is shown in Fig. 2.

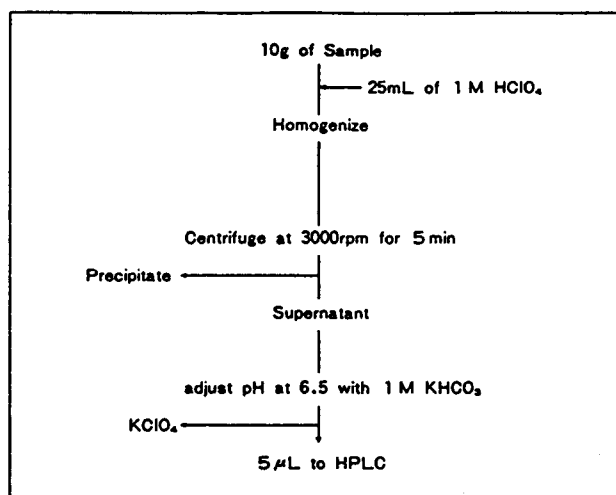


Fig. 2 Pretreatment of Sample

■ Application to Fish Meat

Fig. 3 shows an example of analysis of tuna meat. The fresh sample is shown on the left, and the sample left for 3 hours at 30°C is shown on the right. The K value of fresh fish meat is considered to be around 10%, and as the freshness is lowered, the K value increases.

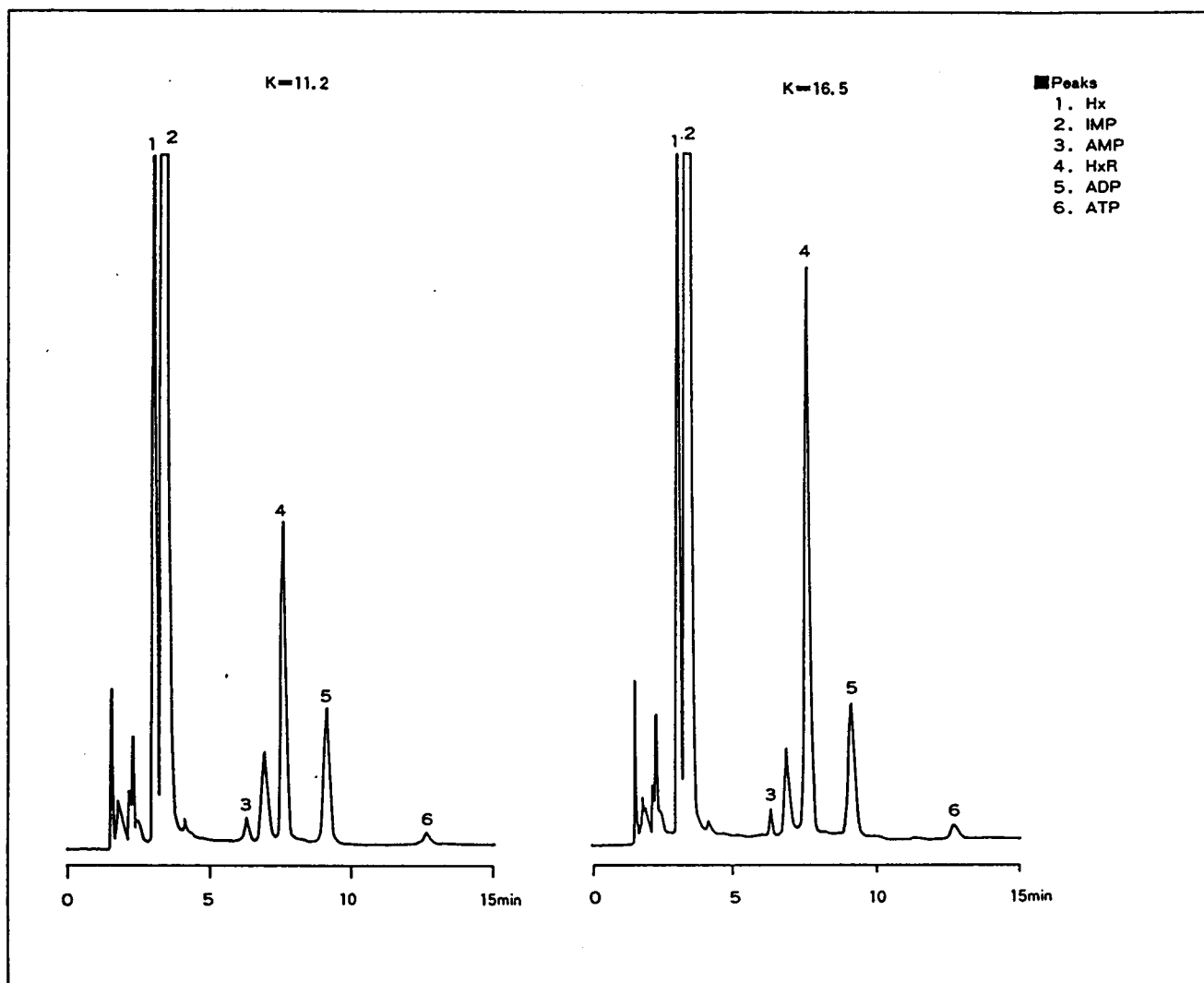


Fig. 3 Example of Analysis of Tuna Meat

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