

### 2.24 Quantitation of vinyl acetate in EVA - FTIR

#### •Explanation

Ethylene/vinyl acetate Copolymer (EVA) has a good degree of transparency and is used in a variety of applications such as fertilizer bags, wrapping film, bottles, and tubes. The elasticity and thermoplasticity of EVA increases with the amount of vinyl acetate contained. There are a number of ways of quantifying the vinyl acetate content in EVA, and the method introduced here is the comparatively simple ATR method using the FTIR.

#### •Results

Shown in Fig. 2.24.1 are the results of the measurement of samples with vinyl acetate contents of 0, 5, and 7% using a horizontal ATR system. It can be seen that the greater the content of vinyl acetate, the greater the intensity of the C=O peak in the 1,740cm<sup>-1</sup> region. Fig. 2.24.2 is a calibration curve generated by taking the peak ratio to the C-H peak of the 1,460cm<sup>-1</sup> region. Fig. 2.24.3 shows the result of measuring the unknown sample using this calibration curve.

#### References

Polymer Analysis Handbook, Japan Society for Analytical Chemistry, Polymer Analysis Research Group Issue, Asakura Publishing (Japanese)

#### •Analytical Conditions

Accessory : Horizontal ATR(IRE : ZnSe)  
 Resolution : 4cm<sup>-1</sup>  
 Accumulation : 40  
 Apodization : Happ-Genzel  
 Detector : DLATGS

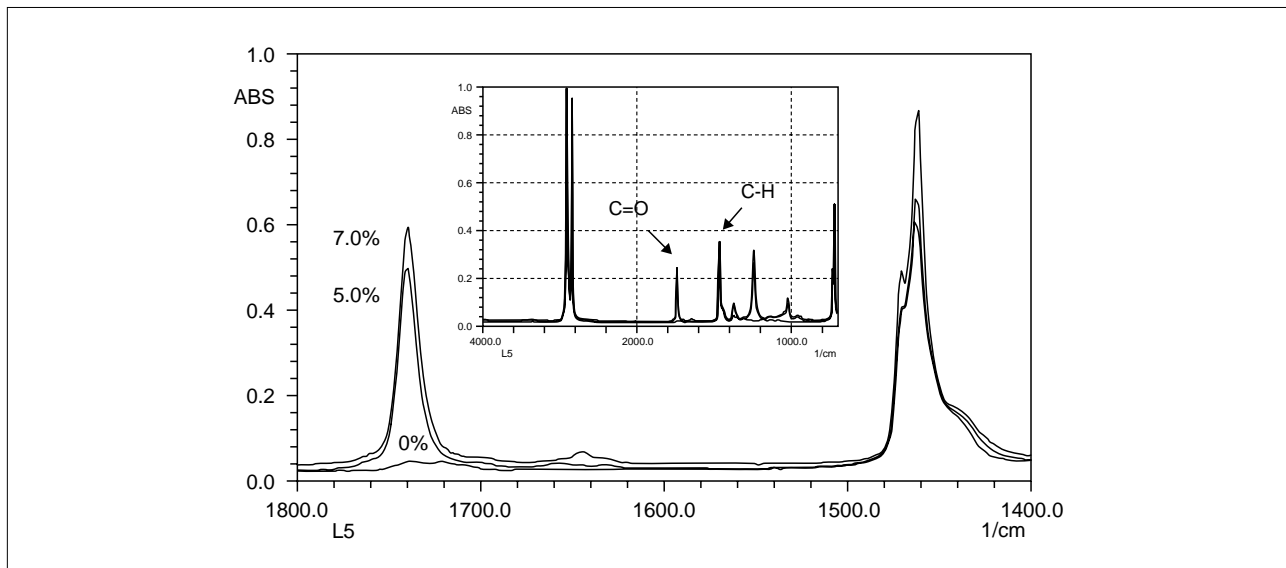


Fig. 2.24.1 ATR spectra of EVA

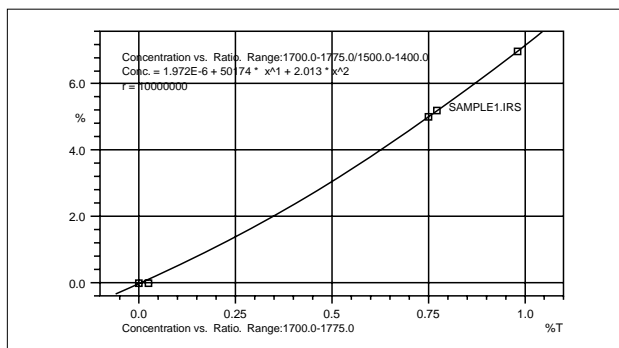


Fig. 2.24.2 Calibration curve of vinyl acetate

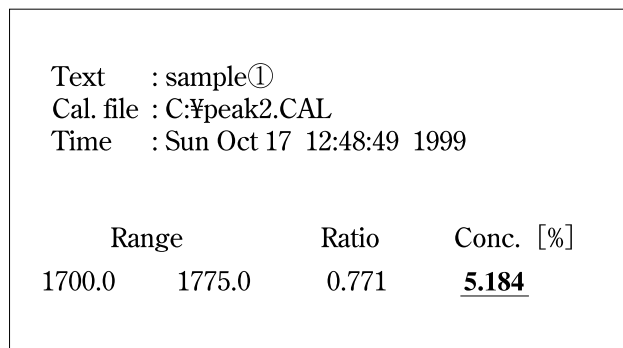


Fig. 2.24.3 Result of quantitation