

EDS

Engineering,
GM DAEWOO Auto & Technology
Standards

TEST METHOD FOR MATERIAL ANALYSIS OF PLASTIC & RUBBER USING FTIR

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1. PURPOSE

This standard aims at specifying the analysis method of plastic and rubber parts used for automobiles using FTIR.

2. EQUIPMENT

2.1. FTIR (Fourier transform infrared spectroscopy)

2.2. Centrifugal separator

2.3. Hot plate

2.4. 50 ml, 100 ml beakers

2.5. Toluene, Chloroform

2.6. Test tube

2.7. Pyrolyzer

2.8. KRS window

3. PRINCIPLE OF TEST

FTIR is a method of performing qualitative and quantitative analysis with the infrared absorption spectrum obtained by measuring the absorbed quantity of the gas, liquid or solid sample for each frequency when the infrared beam (frequency: 4,000 ~ 400 cm) passes through them. The infrared beam absorption spectrum is expressed by a graph with the frequency in the x-axis and the transmittance or absorbance in the y-axis.

The peculiar molecule of the plastic and rubber always repeats movement. Its kinetic energy remains in the similar wavelength range of the infrared beam. When the infrared beam is scanned, the infrared beam wavelength corresponding to the kinetic energy of the molecule is absorbed or transmitted to show a peculiar wavelength band. The peculiar infrared beam wavelength band resulting from the molecular movement confirms the molecular structure of the sample to allow qualitative analysis of the sample.

4. SAMPLE PREPARATION

4.1. Pre-conditioning of plastic parts

4.1.1. Melting

Take a portion of the part free from defected matters and insert it between two glass plates. Raising the temperature to above the melting point of the plastic and pressing the piece between two glass plates produces a sample that has the transparency to permit transmission of light.

4.1.2. Purification