

Nanoscale chemical imaging of multilayer coating film using AFM-IR

Advantages of AFM-IR

- ◆ Ultra-high spatial resolutions (~100nm)
- ◆ Chemical imaging and characterization
- ◆ High Sensitivity

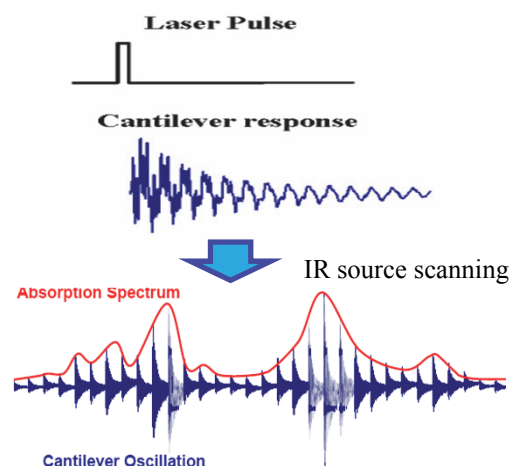
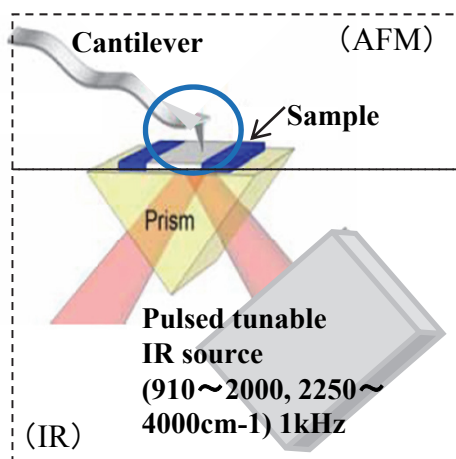
Principle of AFM-IR

Photo (IR) illumination

Rapid thermal expansion of the sample

Cantilever oscillation

IR source scanning (IR absorption)



Application

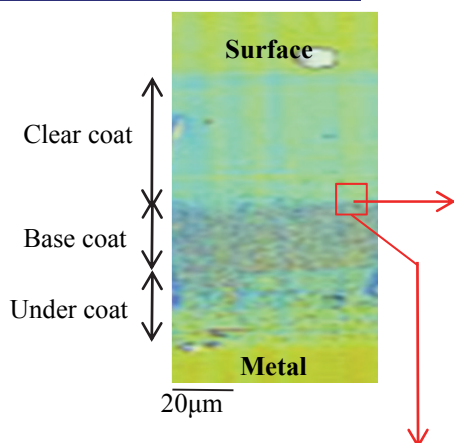


Fig.1 Microscopic Image of the cross section of the coating film

Diffusion of pigment in multilayer coating film

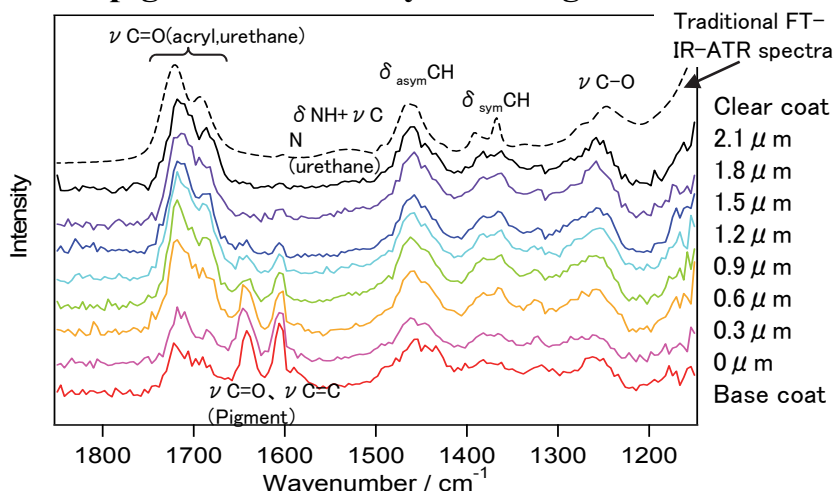


Fig.2 AFM-IR spectra at the interface between the clear and the base coat

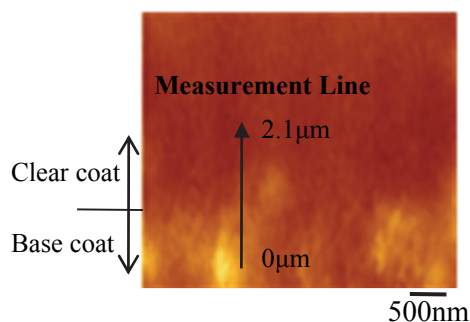


Fig.3 The band intensity mapping of 1640 cm⁻¹

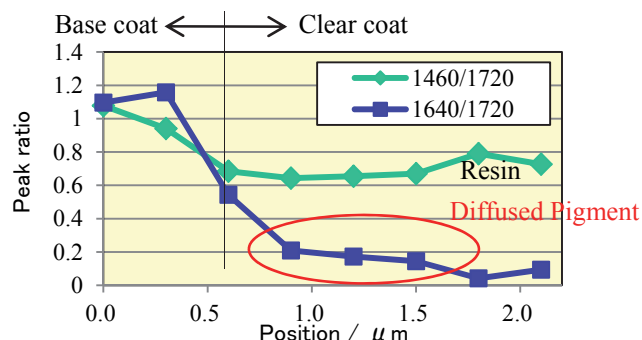


Fig.4 The band intensity of the pigment and the resin.