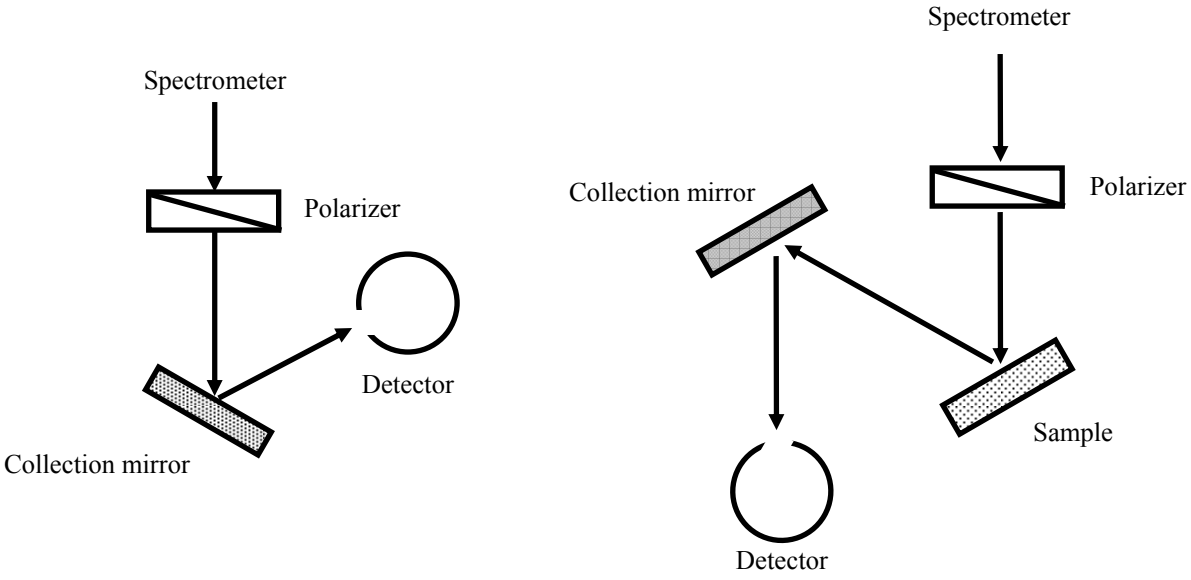
Application Note

UV-0009

Measurement of Dichroic mirror using automated absolute reflectance measurement system

Dichroic mirror is a specific optical element consisting of multi layered dielectric materials that have different refractive indexes, enabling to reflect the light of some specific wavelength range and transmit the light of other wavelength range.
In general, Dichroic mirror has different spectral characteristics depending on polarization condition of incident light or incident angle. Therefore, for evaluation of such Dichroic mirror, it is very important to know its spectral characteristics.

Absolute reflectance measurement system has specific capability to measure both transmittance and reflection spectrum by changing the conditions such as incident angle or polarization condition of incident light.
In this system, the incident light is introduced to sample with incident angle of θ, and then the reflected light from sample is lead to the integrating sphere with detector with an angle set as θ-2θ. Accordingly, it can measure absolute reflectance spectrum which can't be obtained by the general relative reflectance measurement system. In addition, influence form light source fluctuation is removed using double beam method by introducing the reference beam to inside of integrating sphere.



This time by using the absolute reflection measurement system, some Dichroic mirror was measured to obtain the dependence on polarization and incident angle. Fig. 1 shows the reflectance spectrum under the measurement conditions such as incident angle of 45 degree, and polarization conditions of s, p and natural light n. Fig. 2 shows angle dependence of reflectance spectrum under the condition of p and s polarization. It is seen that for both s and p polarization, the reflection region expands to the longer wavelength side with the increase of incident angle.

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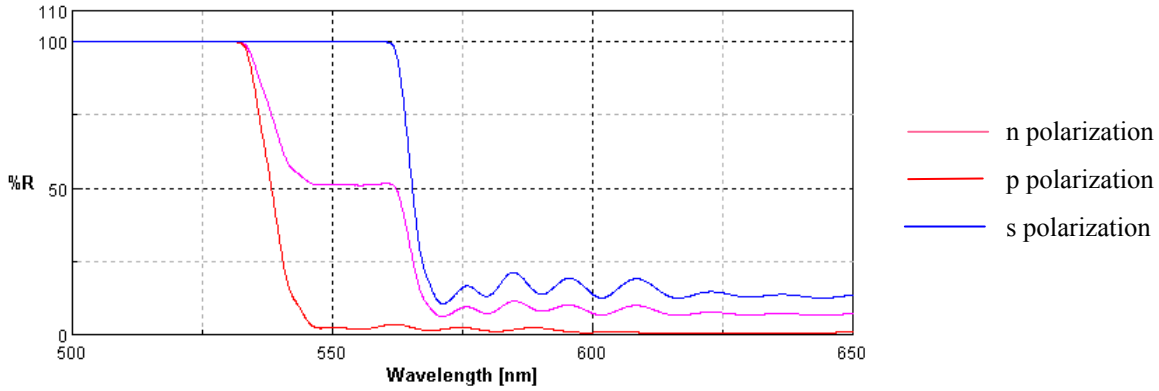

Fig. 1 Polarization characteristics of reflectivity

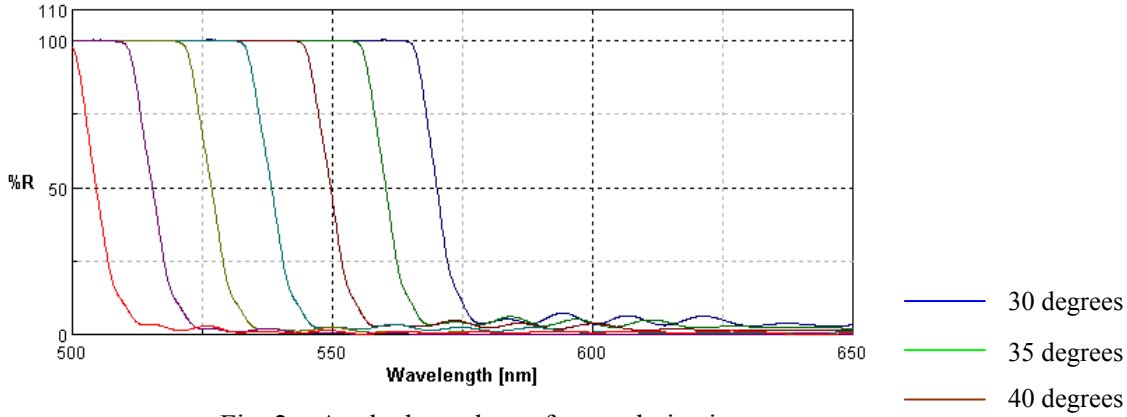

Fig. 2-a Angle dependence for p polarization

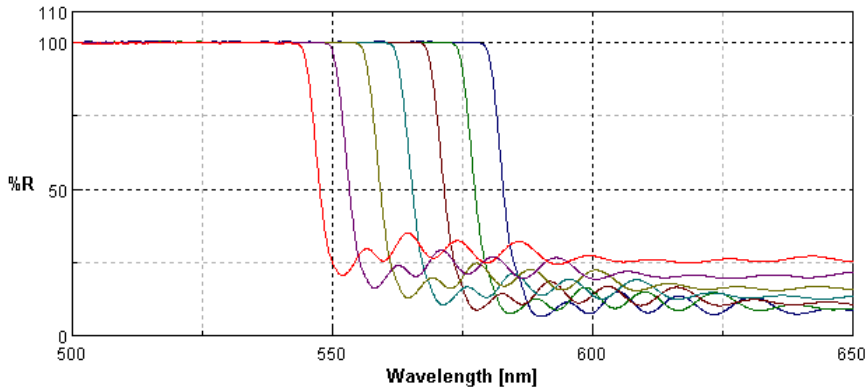

Fig. 2-b Angle dependence for s polarization

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