When light is propagating in an anisotropic material, it is decomposed into two waves with different velocities. The material thus introduces an optical retardation between the two waves. Optical retardation provides the most general method for manipulating light polarizations. In this study we measure the optical retardation using an accurate method, namely the Senarmont method. Our goal is to quantitatively determine the optical retardations of some anisotropic samples currently under research in our lab. In our experiment a white light beam is first monochromated by an interference filter. It is then polarized horizontally by a linear polarizer. The light is then incident on the sample oriented at 45°. The transmitted light has an erect elliptical polarization. The light then passes through a horizontally oriented Senarmont plate, which is made by a Fresnel rhomb and a linear polarizer. The output light from the Senarmont plate is linearly polarized. Its polarization angle indicates the optical retardation caused by the sample. Therefore Senarmont method transfers the phase retardation between two waves into a rotational angle of the input polarization plane. Our experiment confirms that phase retardation is proportional to the thickness of the material, and is inversely proportional to the wavelength of the incident light. The retardation of a transparent tape is measured to be $308 \pm 3$ nm. This research is supported by the College of Arts and Sciences Undergraduate Research and Scholarly Activity Grants.