

## Conclusion

- 1- In this work a simple and accurate interferometric method for measuring the natural birefringence and its dispersion across the visible region of spectrum is presented.
- 2- Although the theoretical and experimental background of the method is nearly known, the fields of application and data processing approach are firstly presented. The method is applicable for liquid and solid samples of fixed thickness all over the slit of the spectrograph.
- 3- A two- term Cauchy dispersion function is most suitable to give accurate values of the birefringence dispersion, because it is simple and time saving.
- 4- The measured birefringence for both a transparent photographic film and mica sheet decreases with increasing wavelength.
- 5- The natural birefringence  $\Delta n$  for an anisotropic material is also evaluated for cellophane sheet by changing its thickness, which is another simple method for obtaining birefringence for anisotropic materials.
- 6- The distribution of the fringes makes it possible to assess the distribution of the stresses inside the plate. This underlies the optical

method of studying stresses (photoelastic stress analysis). A model made from a transparent isotropic material is placed between crossed polarizers. The model is subjected to the action of loads similar to those, which the article itself will experience. The pattern observed in transmitted white light makes it possible to determine the distribution of the strain and also to estimate its magnitude.

- 7- The induced birefringence produced by a certain stress on an isotropic material decreases by increasing wavelength and Cauchy's dispersion function is achieved. The dispersion increases by increasing applied stress upon the sample.
- 8- From the relation between the applied stress and the resulting strain, which is built upon the displacement in the fringe, Young's modulus is evaluated by a simple and accurate method.
- 9- The stress optical coefficient is obtained, with different wavelengths, from the relation between the induced birefringence and the applied stress. The stress optical coefficient depends on the wavelength of the light and the material used.
- 10- The bending of a birefringent plate (Fortepan photographic plate is used in our experiment) introduces additional birefringence. The induced birefringence  $\Delta n$  increases by decreasing radius of curvature (i.e., by increasing the applied stress causing curvature.) and the number of fringes increases and crowds around the center. The natural

birefringence for a Fortepan photographic plate is obtained at infinity value for the radius of curvature.