

## **Abstract**

Contact lenses are manufactured from high-grade plastic polymers and prescribed by specialists to treat the vision defects. Manufacturers are constantly searching for and developing optimal materials for contact lenses to satisfy patients and practitioners in terms of the standard optical characteristics (i.e. refractive index, Abbe number, light reflectance and light transmittance).

Normally, if the refractive index increases, the Abbe number automatically decreases. In this study, two different types of polymer have been used includes the most popularly known optical plastic polymer allyl carbonate which is commonly recognized as CR-39. This first polymer material known by (refractive index, 1.49, density, 1.32 and the Abbe number varies from 58–59. The second polymer material of high refractive index plastics with a refractive index of 1.67 and abbe number of 28 is the polythiourethanes (PTUs).

These polymers have been used to make the contact lenses, the Liou & Brennan model were used to indicate this process. The effect of entrance pupil diameter (EPD) and the field of view (FOV) on the retinal image were evaluated and analyzed using ZEMAX-EE software. The Modulation Transfer Function (MTF), Point Spread Function (PSF), Root Mean Square (RMS), Encircled Energy (EE), the type of aberrations, and the spot diagram were used as criteria to analysis the retinal image degradation. The results are expressed that the PTUs polymer material has good optical properties, and it could be one of the prominent optical polymer that used in the ophthalmic field.