

Measuring pH level using Fresnel Lens**Yousef Alqurashi**

Birmingham University, UK

A Hydrogel sensitive to pH has been fabricated and tested in this work. The hydrogel solution can detect changes in pH in the solution it is in contact with. In this study, the properties of the hydrogel were tested based on the structure of a Fresnel lens. The power intensity of the laser light passing through the hydrogel structure was found to increase with increasing pH. It was found that increasing the temperature in the range 20° to 40°C had an insignificant effect on the results with only a small increase in power with increasing temperature. The simple fabrication process coupled with the pH measuring range makes hydrogel based sensors valuable for various applications such as biomedical use. These pH sensors have the capability of helping diabetic patients identify if they are having a heart attack, based on the pH of blood, and enables them to get the help they need earlier, possibly saving their life. In this work, a pH sensor has been fabricated based on a Fresnel lens structure imprinted on a flexible hydrogel sensitive to pH. The method of fabrication of this sensor is quick and cost-effective. The sensor detected changes within seconds of contact with the pH solution. These pH sensors were also found to be reusable by repetition of the experimental process.

Keywords:

Hydrogel, pH sensors, Fresnel lens, sensor.

Yxa598@bham.ac.uk