

ABSTRAK

PENGUKURAN INDEKS BIAS CAIRAN MENGUNAKAN INTERFEROMETER MICHELSON DENGAN METODE ROTASI SAMPEL

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Indeks bias merupakan parameter optik yang dapat digunakan untuk mengidentifikasi karakteristik suatu medium. Penelitian ini bertujuan mengukur indeks bias larutan gula dan gliserin pada berbagai konsentrasi menggunakan interferometer Michelson. Metode penelitian dilakukan dengan menganalisa perubahan gelap terang pada pusat pola interferensi akibat perubahan sudut putar sampel yang ditempatkan pada *rotary stage* pada salah satu lengan interferometer Michelson. Data jumlah cacah perubahan pusat pola interferensi diperoleh melalui sensor cahaya dan *software Logger Pro*. Penelitian ini dilakukan pada cairan gliserin dengan konsentrasi 0%, 20%, 40%, 60% dan larutan gula dengan konsentrasi 0g/100mL, 20g/100mL, 40g/100mL, 60g/100mL pada panjang gelombang 632,8nm. Nilai indeks bias yang diperoleh pada gliserin secara berturut-turut $(1,32 \pm 0,02)$, $(1,35 \pm 0,01)$, $(1,37 \pm 0,02)$, $(1,42 \pm 0,02)$. Sedangkan pada larutan gula secara berturut-turut $(1,32 \pm 0,02)$, $(1,35 \pm 0,02)$, $(1,40 \pm 0,01)$, $(1,43 \pm 0,02)$. Hasil penelitian menunjukkan bahwa nilai indeks bias meningkat seiring bertambahnya konsentrasi larutan.

Kata kunci : Indeks bias, Interferometer Michelson, Interferensi cahaya, larutan gliserin, larutan gula

ABSTRACT

***MEASUREMENT OF THE REFRACTIVE INDEX OF LIQUIDS
USING A MICHELSON INTERFEROMETER WITH THE SAMPLE
ROTATION METHOD***

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The refractive index is an optical parameter that can be used to identify the characteristics of a medium. This study aimed to determine the refractive indices of glycerin and sugar solutions at various concentrations using a Michelson interferometer. The measurements were performed by analyzing the displacement of the bright and dark fringes at the center of the interference pattern resulting from changes in the rotation angle of the sample mounted on a rotary stage in one arm of the Michelson interferometer. The fringe count of the central interference pattern displacement was obtained using a light sensor and Logger Pro software. The experiments were conducted using glycerin solutions with concentrations of 0%, 20%, 40%, and 60%, and sugar solutions with concentrations of 0 g/100 mL, 20 g/100 mL, 40 g/100 mL, and 60 g/100 mL, employing a laser with a wavelength of 632.8 nm. The measured refractive indices of the glycerin solutions were (1.32 ± 0.02) , (1.35 ± 0.01) , (1.37 ± 0.02) , and (1.42 ± 0.02) , respectively. Meanwhile, the refractive indices of the sugar solutions were (1.32 ± 0.02) , (1.35 ± 0.02) , (1.40 ± 0.01) , and (1.43 ± 0.02) , respectively. The results indicate that the refractive index increases with increasing solution concentration.

Keywords: *Refractive index, Michelson interferometer, light interference, glycerin solution, sugar solution*