



INTISARI

STUDI PEMBUATAN ALAT DETEKSI TINGKAT KEKERUHAN URINE DENGAN LDR DETEKTOR

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Telah dilakukan penelitian tentang pembuatan susunan eksperimen edukasi berbasis fisika dengan metode pemerosotan intensitas laser terusan untuk medis. Penelitian ini dilatarbelakangi oleh perlunya karakteristik cairan tubuh, khususnya urine, secara kuantitatif-elektronis (dengan LDR) dan praktis-empiris (dengan refraktometer ABEE). Adapun tujuan penelitian adalah untuk membandingkan dinamika sinar laser terusan dengan LDR dan dengan turbidimeter serta dilengkapi dengan penentuan nilai indeks biasnya. Manfaat yang dapat diperoleh nantinya, dapat mengerti identitas urine secara kuantitatif berbasis intensitas laser terusan dan nilai indeks biasnya. Metode eksperimen dilakukan dalam lima tahapan. Tahap-1, penyusunan alat. Tahap-2, eksperimen pendahuluan yang meliputi: pengujian kestabilan intensitas laser dan pemilihan laser yang lebih peka terhadap ketinggian cairan keruh. Tahap-3, kalibrasi alat turbidimeter. Tahap-4, pengambilan data enam cairan uji pembanding dan lima sampel urine. Tahap-5, analisis data serta pembahasan. Dari kelima sampel urine, pada ketinggian 3 cm, diperoleh sejumlah nilai kekeruhan sampel urine (sebesar 1,15–20,70 NTU) dengan LDR (0,9–1,5 k Ω) dan dengan refraktometer abbe (1,3350–1,3400).

Kata kunci: informasi kesehatan, kekeruhan urine, transmisi laser, urine



ABSTRACT

STUDY ON THE DEVELOPMENT OF A URINE TURBIDITY DETECTION INSTRUMENT UTILIZING LDR DETECTOR

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A study has been conducted on the development of an educational physics-based experimental setup using the continuous laser intensity attenuation method for medical applications. This research is motivated by the need to characterize bodily fluids—particularly urine—both quantitatively-electronically (using an LDR) and practically-empirically (using an Abbe refractometer). The aim of this study is to compare the behavior of transmitted laser light as detected by an LDR with that measured using a turbidimeter, as well as to determine the refractive index values of the samples. The expected benefit is to gain an understanding of the optical characteristics of urine quantitatively, based on transmitted laser intensity and its refractive index. The experimental method was carried out in five stages. Stage 1 involved constructing the apparatus. Stage 2 was a preliminary experiment, including laser intensity stability testing and selecting the laser most sensitive to varying levels of turbidity. Stage 3 focused on calibrating the turbidimeter. Stage 4 involved data collection from six reference test liquids and five urine samples. Stage 5 comprised data analysis and discussion. From the five urine samples at a height of 3 cm, turbidity values ranged from 1,15 to 20,70 NTU, LDR resistance values ranged from 0.9 to 1.5 k Ω , and refractive index values measured using the abbe refractometer ranged from 1.3350 to 1.3400.

Keywords: *health information, laser transmission, urine, urine turbidity*