

ABSTRAK

Dedi Setiawan

URINOIR PINTAR PENDETEKSI HIDRASI DAN GAS AMONIA PADA URINE

xvi + 66 Halaman + 6 Tabel + 7 Lampiran

Masalah dehidrasi masih sering tidak disadari oleh banyak orang meskipun dampaknya dapat mengganggu keseimbangan cairan tubuh dan fungsi organ. Warna dan bau urin merupakan indikator yang efektif untuk menilai kondisi hidrasi tubuh, di mana warna pekat dan bau menyengat menandakan dehidrasi dan peningkatan kadar amonia. Berdasarkan hal tersebut, penelitian ini mengembangkan prototipe alat "Urinoir Pintar" yang mampu mendeteksi tingkat hidrasi dan kandungan gas amonia dalam urin secara otomatis dan real-time. Sistem ini menggunakan sensor warna TCS3200 untuk menganalisis warna urin sebagai indikator tingkat hidrasi, serta sensor MQ135 untuk mendeteksi kandungan amonia. Data hasil deteksi ditampilkan melalui LCD Graphic 128x64 untuk kemudahan pemantauan. Efektivitas sensor RGB, yang merujuk pada kemampuannya dalam memancarkan dan mendeteksi pantulan radiasi elektromagnetik dari suatu sampel, teramati pada rentang panjang gelombang 415–564, 440–600, dan 510–750. Alat ini diharapkan mampu memberikan solusi praktis dan efisien bagi masyarakat serta tenaga medis dalam pemantauan status hidrasi dan deteksi dini gangguan kesehatan, khususnya terkait keseimbangan cairan dan fungsi ginjal.

Kata Kunci : Urine, Amonia, Dehidrasi, Sensor MQ135, Sensor TCS3200, LCD Graphic

Daftar Pustaka : 23 Jurnal (2013-2023)

ABSTRACT

Dedi Setiawan

SMART URINAIR DETECTS HYDRATION AND AMMONIA GAS IN URINE

xvi + 66 Pages + 6 Tables + 7 Attachments

Dehydration problems are still often not realized by many people even though their impact can disrupt the body's fluid balance and organ function. The color and odor of urine are effective indicators for assessing the body's hydration condition, where a dark color and pungent odor indicate dehydration and increased ammonia levels. Based on this, this study developed a prototype of a "Smart Urinal" device that is able to detect hydration levels and ammonia gas content in urine automatically and in real-time. This system uses a TCS3200 color sensor to analyze urine color as an indicator of hydration levels, and an MQ135 sensor to detect ammonia content. The detection results are displayed via a 128x64 Graphic LCD for easy monitoring. The effectiveness of the RGB sensor, which refers to its ability to emit and detect reflected electromagnetic radiation from a sample, is observed in the wavelength ranges of 415–564, 440–600, and 510–750. This tool is expected to provide a practical and efficient solution for the public and medical personnel in monitoring hydration status and early detection of health disorders, especially related to fluid balance and kidney function.

Keywords: Urine, Ammonia, Dehydration, MQ135 Sensor, TCS3200 Sensor, Graphic LCD

Bibliography: 23 Journals (2013-2023)