

ABSTRAK

SISTEM DETEKSI FORMALIN DAN BORAKS PADA BAHAN MAKANAN BERBASIS *INTERNET OF THINGS* (IoT) MENGGUNAKAN SENSOR HCHO DAN TCS3200 (2026 : 99 Halaman + 33 Gambar + 27 Tabel +Daftar Pustaka + Lampiran)

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JURUSAN TEKNIK ELEKTRO

Penyalahgunaan formalin dan boraks pada pangan dapat membahayakan kesehatan sehingga diperlukan sistem deteksi yang cepat dan mudah digunakan. Penelitian ini bertujuan merancang sistem monitoring formalin dan boraks berbasis Internet of Things (IoT) menggunakan ESP32, sensor Grove HCHO untuk mendeteksi formalin dan sensor TCS3200 untuk mendeteksi boraks melalui perubahan warna kertas kunyit. Hasil pengujian menunjukkan bahwa sistem mampu membedakan sampel berdasarkan kandungan formalin dan boraks, dengan data ditampilkan secara real-time pada LCD I2C, Blynk, dan Google Spreadsheet serta memberikan kategori kondisi AMAN, WASPADA, BAHAYA, dan SANGAT BAHAYA.

Kata Kunci : ESP32, Internet of Things, Formalin, Boraks, Grove HCHO, TCS3200.

ABSTRAC

FORMALIN AND BORAX DETECTION SYSTEM IN FOOD PRODUCTS BASED ON THE INTERNET OF THINGS (IoT) USING HCHO AND TCS3200 SENSORS

(2026: 99 Pages, 33 Figures, 27 Tables, References, and Appendices)

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The misuse of formalin and borax in food products can pose health risks, creating a need for a rapid and easy-to-use detection system. This study aims to design an Internet of Things (IoT)-based monitoring system for detecting formalin and borax using an ESP32 microcontroller, a Grove HCHO sensor to detect formalin, and a TCS3200 sensor to detect borax through color changes in turmeric paper. The test results show that the system can distinguish food samples based on formalin and borax content, with data displayed in real time on an I2C LCD, Blynk application, and Google Spreadsheet, and classified into SAFE, CAUTION, DANGER, and VERY DANGEROUS categories.

Keywords: ESP32, Internet of Things, Formalin, Borax, Grove HCHO, TCS3200.