BEAUTY (BAGASSE AIR PURIFIER MONITORING SYSTEM) : FILTER UDARA KOMBINASI AMPAS TEBU, SILICA GEL, DAN ZEOLIT DENGAN SISTEM MONITORING BERBASIS IOT IMPLEMENTASI ESP32 DAN SENSOR MQ-135

Mardliyyatul Aula, Auliya Maulida Kasana
MAN 1 Lamongan

ABSTRAK

Data World Health Organization menunjukkan 99% populasi global menghirup udara melebihi batas pedoman WHO. United States Environmental Protection Agency (EPA) menjelaskan bahwa konsentrasi beberapa polutan seringkali 2-5 kali lebih tinggi daripada di luar ruangan. Salah satu solusi dari permasalahan tersebut adalah dengan pemakaian air purifier. Namun harga air purifier mahal dan belum dapat mendeteksi mutu udara. Solusi alternatif yang dikemukakan oleh peneliti ialah dengan membuat BEAUTY (Bagasse Air Purifier Monitoring System) yang menggunakan susunan arang aktif ampas tebu, silica gel, dan dilengkapi dengan microcontroller ESP32 dan sensor MQ-135. Nantinya kualitas udara dalam ruangan dapat di monitor melalui aplikasi BEAUTY pada smartphone. Hasilnya, alat BEAUTY mampu mendegradasi udara yang semula 1700-2400 ppm menjadi dibawah 1000 ppm dalam kurun waktu 20-30 menit yang merupakan tingkat udara rata-rata. Alat BEAUTY mampu mendegradasi polutan obat nyamuk sebesar 72% dalam waktu 1 jam, asap arang 53% dalam waktu 1 jam, dan asap rokok 66 % selama 1 jam.

Kata Kunci : Ampas Tebu, ESP32, MQ-135, Silica Gel, Zeolite

BEAUTY (BAGASSE AIR PURIFIER MONITORING SYSTEM): AIR FILTER COMBINATION OF SUGARCANE, SILICA GEL, AND ZEOLIT WITH IOT-BASED MONITORING SYSTEM IMPLEMENTATION OF ESP32 AND MQ-135 SENSOR

Mardliyyatul Aula, Auliya Maulida Kasana
MAN 1 Lamongan

ABSTRACT

World Health Organization data shows that 99% of the global population breathes air that exceeds WHO guidelines. United States Environmental Protection Agency (EPA) explains that concentrations of some pollutants are often 2-5 times higher than in normal outdoors. One solution to this problem is to use an air purifier. However, the price of an air purifier is quite expensive and cannot detect air quality. An alternative solution by the researchers is to make BEAUTY (Bagasse Air Purifier Monitoring System) which uses an array of activated sugarcane bagasse, silica gel, and is equipped with an ESP32 microcontroller and MQ-135 sensor. Later indoor air quality can be monitored through the BEAUTY application on a smartphone. As a result, the BEAUTY device is able to degrade air from 1700-2400 ppm to below 1000 ppm within 20-30 minutes which is an average air level. The BEAUTY tool is able to degrade mosquito repellent pollutants by 72% in 1 hour, charcoal smoke by 53% in 1 hour, and cigarette smoke by 66% in 1 hour.

Keyword : Bagasse, ESP32, MQ-135, Silica Gel, Zeolite