

ABSTRACT

The problem of ineffective waste management remains a challenge in Indonesia, especially at Ar-Raudlah Islamic Boarding School, which has high social activity and generates a significant amount of waste. The Islamic boarding school and the surrounding community usually rely on open burning methods due to the lack of waste transportation services and available disposal sites. Effective waste management is the key to creating a clean and healthy environment. Therefore, this study aims to implement a wet scrubber filter system to reduce gas emissions produced from waste incineration. The method used is an experimental approach with quantitative analysis, where the filtration system consists of MQ-7 and MQ-135 sensors, a blower, nozzle, water pump, and filtration media made from charcoal, a mixture of ijuk fibers and eggshells, as well as dacron foam. The test results show that the filter can reduce CO gas emissions by 52.76% and CO₂ gas emissions by 61.81%, indicating that the filter is effective in reducing residual gas emissions from the combustion process.