

**SYNTHESIS AND CHARACTERISATION OF PANI/CSA IN
AMMONIA DETECTION**

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ABSTRACT

SYNTHESIS AND CHARACTERIZATION OF PANI/CSA IN AMMONIA DETECTION

Since ammonia is categorized as a toxic gas, development of a new, simple and inexpensive gas detector was put onto the up front desk. It was expected the conducting polymers to be the most reliable material for this gas detector development purpose since it has ease processability and tunable conductivity features. Among the conducting polymers available, polyaniline (PANI) was chosen for this study. PANI was synthesized in the presence of camphorsulfonic acid (CSA) as dopant via chemical oxidation using potassium peroxydisulfate (KPS) as the oxidizing agent. The chemical structure was studied using ultraviolet-visible (UV-Vis) spectroscopy and Fourier transform infrared (FTIR). The conducting properties were measured using a multimeter. As the result, the PANI/CSA film possessed conductivity at $3.04 \times 10^{-6} \text{ S cm}^{-1}$. The morphology of the PANI/CSA sample was studied using scanning electron microscopy (SEM). The response sensitivity of the film toward exposure of ammonia at different concentration was evaluated. In the UV-Vis spectrum, it is useful to analyze the influence of ammonia exposure towards the PANI/CSA film. It was evaluated that the film displays highest sensitivity at 80 ppm exposure of ammonia. The film exhibit high selectivity towards ammonia compares to diethyl ether and hexane. However, the film exhibits low reusability.