

## Documents

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**Preliminary study on designing and development of a synthesis gas analyser in the process of gasification**  
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**Abstract**

Malaysia has a great development in biomass industry. The industry needs to use synthesis gas analyser for monitoring gas composition in the process of gasification. Since there is no local production of such analyser, it is commonly imported from oversea for a very high price. Furthermore, analysers in the market are not easily customized which ends up with the industry having to buy separate analysers to measure several types of gas. Therefore, this study focuses on developing a portable synthesis gas analyser for biomass gasification that suits the local industry's application which is low cost, at the same time, maintaining its accuracy and reliability. The analyser is integrated with a monitoring system using the Internet of Things (IoT) concept. The developed analyser uses Raspberry Pi microcomputer as the core element in its electronic design along with several other necessary hardware components. The analyser is capable of measuring methane (CH<sub>4</sub>), carbon monoxide (CO), hydrogen (H<sub>2</sub>), and carbon dioxide (CO<sub>2</sub>). It also includes a web server for displaying its measurement in a local network and the internet for monitoring purpose. Selected sensors used in the analyser shows positive response toward respective gas in a sensor validation experiment. Thus, the sensors can be used for further development of the analyser. Case building, addition of the web server's features, and accuracy and reliability experiment will be conducted in future development of the analyser. Therefore, this study shows the possibility of developing a portable synthesis gas analyser. Furthermore, the analyser may offer a cheaper yet reliable alternative for gasification process monitoring to the local biomass industry in the future. © 2018 Penerbit Akademia Baru.

**Author Keywords**

Analyser; Biomass; Gasification technology; Internet of things; Monitoring system; Raspberry pi; Syngas; Synthesis gas

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