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Hydrogen sulfide (H2S) detection system in risky areas with real-time display via smartphone

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In the past few years, there were accidents that caused people to die from hydrogen sulfide gas. This is due to the lack of warning system and appropriate measuring equipment. General commercial hydrogen sulfide detectors are not suitable to use in the risk area as users have to take them into the area which could be dangerous if the gas concentration exceeds the limit. Therefore, the purpose of this research was to develop an innovation that can remotely detect hydrogen sulfide concentration, display detected results to the users via smartphones. It also alerts when the concentration is in hazards level. This innovation was designed to be compact and easy to use. It applies a microcontroller (Arduino) combine with a MQ-136 gas sensor to measure hydrogen sulfide concentration. Measured results are real-time analyzed to determine the hazards of the gas and user recommendations. All measured and analyzed results are displayed both onsite and online. An OLED display is used to show the results for onsite. A buzzer is also used to warn the users when the gas concentration is at a dangerous level. For online display, the users can remotely monitor all results via their mobile devices (smartphones or tablets). Thingspeak.com was used as platform to collect results. A mobile application was created using MIT App inverter to retrieve the results and display them on mobile devices. The innovation prototype was tested to measure hydrogen sulfide gas in the range of 0-200 ppm. The operation of the prototype is in accordance with all requirements. These results show that the prototype can be used for real-time remote hydrogen sulfide measurement.

Keywords: Hydrogen sulfide detection, microcontroller and sensor, remote measurement

Authors: Mr KITSAMRET, Wiphu; Mrs TUEANWIRADET, Thanyathon; Mr UTTAWAT, Titat

Presenters: Mr KITSAMRET, Wiphu; Mrs TUEANWIRADET, Thanyathon; Mr UTTAWAT, Titat

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