Brought to you by INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

Scopus

Back

Comparative analysis of hydrogen sensors in a test chamber following ISO 26142:2010 standards

International Journal of Hydrogen Energy • Article • 2026 •
DOI: 10.1016/j.ijhydene.2026.154516

Zahaba, Maryam [a] ; Nur-Akasyah J. [a] ; Fatihah Yatin, Hermanuralia [a] ;
Murad, Alyaa Syahirah A. [a] ; Ismail, Mohamad Wafiuddin [a, b] ; +6 authors

[a] Department of Chemistry, Kulliyyah of Science, International Islamic University Malaysia, Jalan Sultan Ahmad Shah, Bandar Indera Mahkota, Pahang, Kuantan, 25200, Malaysia

Show all information

0
Citations

Full text Export Save to list

Document Impact Cited by (0) References (51) Similar documents

Abstract

AbstractThis study presents a comparative analysis of three commercially available hydrogen (H_2) sensors using a self-developed test chamber constructed in accordance with ISO 26142:2010. Sensor performance was assessed based on accuracy, stability, repeatability, response and recovery times, and selectivity to carbon dioxide (CO_2). Absolute error and relative error analyses were used to quantify accuracy statistically. Results showed that Sensor 1 and Sensor 2 achieved the highest accuracy, with Sensor 2 also demonstrating good stability. Repeatability testing indicated that Sensor 1 produced the most consistent multi-cycle measurements. Sensor 2 exhibited the fastest response behavior, although its response and recovery times slightly exceeded ISO 26142:2010 thresholds. All sensors maintained selectivity toward H_2 in the presence of CO_2. Overall, the findings highlight the importance of controlled test conditions and standardized assessment protocols. Among the sensors evaluated, the electrochemical-based sensor demonstrated the strongest overall performance across

key parameters. © 2026 Hydrogen Energy Publications LLC. Published by Elsevier Ltd. All rights are reserved, including those for text and data mining, AI training, and similar technologies.

Author keywords

Carbon dioxide; Electrochemical sensors; Hydrogen; ISO 26142:2010; Test chamber

Indexed keywords

Engineering controlled terms

Abstracting; Data mining; Electrochemical sensors; Error analysis; ISO Standards

Engineering uncontrolled terms

Absolute error; Carbon dioxides (CO); Comparative analyzes; Electrochemicals; Hydrogen sensor; ISO 26142:2010; Relative errors; Response and recovery time; Sensor performance; Test chambers

Engineering main heading

Carbon dioxide; Hydrogen

Funding details

Details about financial support for research, including funding sources and grant numbers as provided in academic publications.

Funding sponsor	Funding number	Acronym
International Islamic University Malaysia See opportunities by IIUM		IIUM
PETRONAS See opportunities by PETRONAS	SPP24-233-0233	PETRONAS

Funding text 1

The research leading to these results received funding from the Petroliam Nasional Berhad (PETRONAS) under Grant Agreement ID: SPP24-233-0233. The authors acknowledge financial support from the Petroliam Nasional Berhad (PETRONAS). The authors would also like to thank the International Islamic University of Malaysia (IIUM) for providing us with facilities to assist with the preparation of this manuscript.

Funding text 2

The research leading to these results received funding from the Petroliam Nasional Berhad (PETRONAS) under Grant Agreement ID: SPP24-233-0233 .

Corresponding authors

Corresponding author	M. Zahaba
Affiliation	Department of Chemistry, Kulliyyah of Science, International Islamic University Malaysia, Jalan Sultan Ahmad Shah, Bandar Indera Mahkota, Pahang, Kuantan, 25200, Malaysia
Email address	maryamzahaba@iium.edu.my

© Copyright 2026 Elsevier B.V., All rights reserved.

About Scopus

What is Scopus

Content coverage

Scopus blog

Scopus API

Privacy matters

Language

日本語版を表示する