IEEE Sensors Journal

Decision Letter (Sensors-18647-2017)

From: g.barillaro@iet.unipi.it

To: materer@okstate.edu

CC:

Subject: Decision on Sensors-18647-2017

Body: 09-Aug-2017

Paper:Sensors-18647-2017, Performance of Available, Low-Cost Sensors for Carbon Dioxide and Methane

Dear Dr. Materer,

I am writing to you concerning the above referenced manuscript, which you submitted to the IEEE Sensors Journal.

Based on the enclosed set of reviews, found at the bottom of this letter, this manuscript has not been recommended for publication.

While the decision of the Associate Editor may not be positive, based on the comments of the reviewers, you may wish to consider and implement these comments. The current decision does not bias any future submission of a rework as a new manuscript; however if received by this Journal, this new manuscript will be moved to peer review only if it shows noticeable changes and improvements compared to the currently rejected manuscript.

Thank you for considering IEEE Sensors Journal for
publication of your work.

If you have any questions regarding the reviews or this decision, please contact me directly. Any other support inquiries should be directed to Lauren Young at l.young@ieee.org.

Sincerely,

Dr. Giuseppe Barillaro
Associate Editor, IEEE Sensors Journal

Giuseppe Barillaro, Ph.D.
Associate Professor
Information Engineering Department
University of Pisa
via G. Caruso 16, 56126 Pisa, Italy
Tel +39 050 2217 601
email g.barillaro@iet.unipi.it
web www.iet.unipi.it/g.barillaro
g.barillaro@iet.unipi.it

https://mc.manuscriptcentral.com/sensors

Review Comments:

Reviewer: 1

Recommendation: Reject (Paper is not acceptable for the Sensors Journal. Author should be encouraged to submit to another journal.)

Comments:
This paper entitled "Performance of Available, Low-Cost Sensors for Carbon Dioxide and Methane", by Honeycutt et al, evaluated a range of potential sensors for measuring of ppm level concentrations of carbon dioxide and methane for low-power environmental monitoring instrumentation. It found that MQ-4 sensor is very attractive for low-power portable devices for environmental monitoring. While in my opinion, there is not much innovation in the full manuscript. The platforms and methods for evaluating sensors are also common. Many excellent research works have been reported.1 2,3 4 Therefore, I advise you to against the publication of this article in your journal.

(1) The vertical coordinate of Figure 3 should be corrected.
(2) The images of the sensor platform should be added

(1) Deisher, U. M. A. S. D. P. S. M. IEEE 2006, 4, pp.
(2) Somov, A.; Baranov, A.; Spirjakin, D.; Spirjakin, A.; Sleptsov, V.; Passerone, R. Sensors and Actuators A: Physical 2013, 202, 217.
(3) Vergara, A.; Fonollosa, J.; Mahiques, J.; Trincavelli, M.; Rulkov, N.; Huerta, R. Sensors and Actuators B: Chemical 2013, 185, 462.
(4) Fonollosa, J.; Sheik, S.; Huerta, R.; Marco, S. Sensors and Actuators B: Chemical 2015, 215, 618.

Additional Questions:
1. Is the topic appropriate for publication in these transactions?: Perhaps

2. Is the topic important to colleagues working in the field?: No

1. Is the paper technically sound? If no, why not?: Yes

2. Is the coverage of the topic sufficiently comprehensive and balanced?: Treatment somewhat unbalanced, but not seriously so.

3. How would you describe the technical depth of the paper?: Appropriate for the generally knowledgeable individual Working in the Field or a Related Field

4. How would you rate the technical novelty of the paper?: Not novel

1. How would you rate the overall organization of the paper?: Poor

2. Are the title and abstract satisfactory?: Yes

title and abstract explanation:

3. Is the length of the paper appropriate? If not, recommend how the length of the paper should be amended, including a possible target length for the final manuscript.: Yes

length of the paper recommendation:

4. Are symbols, terms, and concepts adequately defined?: Yes

5. How do you rate the English usage?: Satisfactory

6. Rate the Bibliography?: Satisfactory

1. How would you rate the technical contents of the paper?: good

2. How would you rate the novelty of the paper?: not novel

3. How would you rate the "literary" presentation of the paper?: mostly accessible

4. How would you rate the appropriateness of this paper for publication in this IEEE Transactions?: poor match

Would you recommend this paper for a Best Paper Award?: No

Reviewer: 2

Recommendation: Reject (Paper is seriously flawed; do not encourage resubmission.)

Comments:
This manuscript presented a systematic study on several commercially available sensors for carbon dioxide and methane detection. However, no novelty can be found in this work, and I have to reject it.
Other comments:
1. English should be improved throughout the text. There are many grammar errors, e.g. page 1 line 14, "in field" rather than "in a field", line 1, "a known gas concentrations", line 35, "in understand their impact", line 53, "based on the measuring"
2. In Fig.1, the diagram looks very complicated. Since the function of the setup to provide gas mixing, two flow controllers seem enough to implement mixing. Why needs the two solenoid valves? More details should be provided.
3. In section II 2nd paragraph, since the authors stated that NDIR is not suitable for methane detection due to low absorbance and overlap with other interferents, why did the authors still use NDIR sensors for methane sensing? How to solve this issue in practical applications?
4. The authors stated that chemiresistive sensors have many significant drawbacks. There issues would lead to negative results, how to solve these in applications?
5. In Table II, what do diffusion based and flow based sensors mean?
6. In Fig. 2, a setup was presented to implement serial detection. However, in chemiresistive sensors, chemical reactions would happen e.g. methane. Would carbon dioxide and water be produced after reaction? If so, will the new carbon dioxide and water interfere results in the following tests?
7. Fig. 3 presents continuous test results of two sensors. No transition results were observed between two steps. Does it indicate that the response time of the sensors is very short?
8. In Fig. 4, the MQ-4 sensor presented a very slow response since the conductivity kept increasing over time, indicating low response time. However, the same sensor presented a fast response in Fig. 6. Why?
9. In Fig. 9, the non-linear fit looks unacceptable. Are these results reproducible? Calibration equations and linearity should be provided.

Additional Questions:
1. Is the topic appropriate for publication in these transactions?: Perhaps

2. Is the topic important to colleagues working in the field?: Moderately

1. Is the paper technically sound? If no, why not?: Yes

2. Is the coverage of the topic sufficiently comprehensive and balanced?: Treatment somewhat unbalanced, but not seriously so.

3. How would you describe the technical depth of the paper?: Appropriate for the generally knowledgeable individual Working in the Field or a Related Field

4. How would you rate the technical novelty of the paper?: Not novel

1. How would you rate the overall organization of the paper?: Could be improved

2. Are the title and abstract satisfactory?: No (explain)

title and abstract explanation: In the abstract, the authors claimed the evaluation of sensors for usage in field deployable solar-powered devices. However, no devices are mentioned in the manuscript.

3. Is the length of the paper appropriate? If not, recommend how the length of the paper should be amended, including a possible target length for the final manuscript.: Yes

length of the paper recommendation:

4. Are symbols, terms, and concepts adequately defined?: Yes

5. How do you rate the English usage?: Needs improvement

6. Rate the Bibliography?: Satisfactory

1. How would you rate the technical contents of the paper?: fair

2. How would you rate the novelty of the paper?: not novel

3. How would you rate the "literary" presentation of the paper?: mostly accessible

4. How would you rate the appropriateness of this paper for publication in this IEEE Transactions?: good match

Would you recommend this paper for a Best Paper Award?: No

Reviewer: 3

Recommendation: Review Again After Resubmission (Paper is not acceptable in its current form, but has merit. A major rewrite is required. Author should be encouraged to resubmit a rewritten version after the changes suggested in the Comments section have been completed.)

Comments:
The paper can be considered for the publication after the following revisions and improvements.

1) The quality of the figures 2, 4-8, and 9 should be improved (including the font size).

2) The selectivity is one of the most important parameters of sensing devices. Therefore, the selectivity of the sensors should be studied and considered in the presented work. For examples; the sensing properties should be studied for ethane, butane, etc.

3) How have been chosen the concentrations of the gases. Why the authors have chosen 512, 609, 784 ppm and not 500, 600 and 800?

Additional Questions:
1. Is the topic appropriate for publication in these transactions?: Yes

2. Is the topic important to colleagues working in the field?: Moderately

1. Is the paper technically sound? If no, why not?: Yes

2. Is the coverage of the topic sufficiently comprehensive and balanced?:

3. How would you describe the technical depth of the paper?: Appropriate for the generally knowledgeable individual Working in the Field or a Related Field

4. How would you rate the technical novelty of the paper?: Somewhat novel

1. How would you rate the overall organization of the paper?: Could be improved

2. Are the title and abstract satisfactory?: Yes

title and abstract explanation:

3. Is the length of the paper appropriate? If not, recommend how the length of the paper should be amended, including a possible target length for the final manuscript.: Yes

length of the paper recommendation:

4. Are symbols, terms, and concepts adequately defined?:

5. How do you rate the English usage?: Satisfactory

6. Rate the Bibliography?:

1. How would you rate the technical contents of the paper?:

2. How would you rate the novelty of the paper?:

3. How would you rate the "literary" presentation of the paper?:

4. How would you rate the appropriateness of this paper for publication in this IEEE Transactions?:

Would you recommend this paper for a Best Paper Award?:

Date Sent: 09-Aug-2017

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