Paper Title:

Electro-Optical Nose for Indoor Air Quality Monitoring

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1 Summary

1.1 Motivation

In this paper authors aim to develop a low-cost reliable electro-optical nose that can measure and monitor gases such as CO2 and CH4 which affects indoor air quality by combining NDIR and MOX sensors.

1.2 Contribution

The main contribution of this paper is the design and validation of an electro-optical nose (NEONOSE) which combines NDIR and MOX sensors to detect gases that affect indoor air quality. They also demonstrated the advantages of using NDIR and MOX sensors at together for high selectivity and sensitivity. They also showed different performances of the device in different concentration, humidity and effect of drift.

1.3 Methodology

In this paper authors used a gas mixing unit to generate different gas samples with controlled concentration and humidity. They used NEONOSE which of two boards with NDIR and MOX sensors to measure the gas samples. They used and Android app and LabView app in windows to control the device. Also, they used MATLAB to perform data analysis using PCA and PLS.

Conclusion

The authors conclude that the designed electro-optical nose is a low-cost effective device and addition NDIR with MOX sensors gives better result in measuring specific gases responsible for indoor air pollution. They also showed that NDIR is less affected by humidity that MOX sensors.

2 Limitations

2.1 First Limitation

In this paper they used only two types and sensors and gases. They could have used more sensors to test if others work better or not and also there could be more gases which can be responsible for indoor air quality.

2.2 Second Limitation

Another limitation of this that the device was not tested in real indoor environment such as school, hospital, office etc where the gas concentrations and humidity levels can be dynamic and unpredictable.

3 Synthesis

This paper presents an electro-optical nose that used NDIR and MOX sensors combination to measure and monitor indoor air quality. This device can detect and discriminate CO2 and CH4 gases at different concentrations and humidity levels. The device has potential applications in indoor air quality monitoring and other fields as well.