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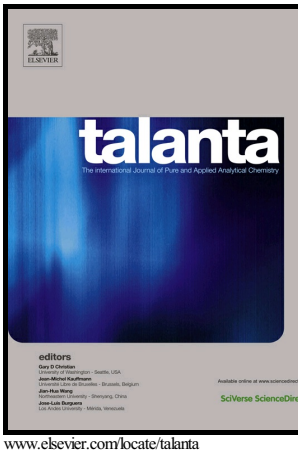

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Application of electronic nose for industrial odors and gaseous emissions measurement and monitoring- an Overview

Sharvari Deshmukh [a,c], Rajib Bandyopadhyay [c], Nabarun Bhattacharyya [b*], R.A.Pandey [a**], Arun Jana [b]

[a] CSIR-National Environmental Engineering and Research Institute, Nagpur - 440020, India

[b]Centre for Development of Advance Computing, Kolkata - 700091, India

[c]Department of Instrumentation and Electronics Engineering, Jadavpur University, Kolkata - 700098, India

E-mail address: nabarun.bhattacharya@cdac.in (N. Bhattacharyya),
*Corresponding author: Tel.: +91 33 23573581; fax: +91 33 23575141.
E-mail address: ra_pandey@neeri.res.in (R.A. Pandey).
** Corresponding author: Tel.: +91 712 2240097; fax: +91 712 2249961

Abstract

The present review evaluates the key modules of the electronic nose, a biomimetic system, with specific examples of applications to industrial emissions monitoring and measurement. Regulations concerning the odor control are becoming very strict, due to ever mounting environmental pollution and its subsequent consequences and it is advantageous to employ real time measurement system. In this perspective, systems like the electronic nose are an improved substitute for assessing the complex industrial emissions over other analytical techniques (odorant concentration measurement) and olfactometry (odor concentration measurement). Compared to tools like gas chromatography, electronic nose systems are easy to develop, are non – destructive and useful for both laboratory and on field purposes. Although there has been immense development of more sensitive and selective sensor arrays and advanced data mining techniques, there have been limited reports on the application of electronic nose for the measurement of industrial emissions. The current study sheds light on the practical applicability of electronic nose for the effective industrial odor and gaseous emissions measurement. The applications categorization is based on gaseous pollutants released from the industries. Calibration and calibration transfer methodologies have been discussed to enhance the applicability of electronic nose system. Further, industrial gas grab sampling technique is reviewed. Lastly, the electronic mucosa system, which has the ability to overcome the flaws of electronic nose system, has been examined. The review ends with the concluding remarks describing the pros and cons of artificial olfaction technique for the industrial applications.

Keywords: Electronic nose, Industrial odor, Sensors, Data analysis, Industrial sampling techniques, Industrial application