Jožef Stefan Institute
Ljubljana, Slovenia

K7 / Department for
Nanostructured Materials

SEMINAR

Wednesday, 7.12.2022, 13.00, Kolar's lecture hall

On Colorimetric Gas Sensors for Environmental and Safety Applications

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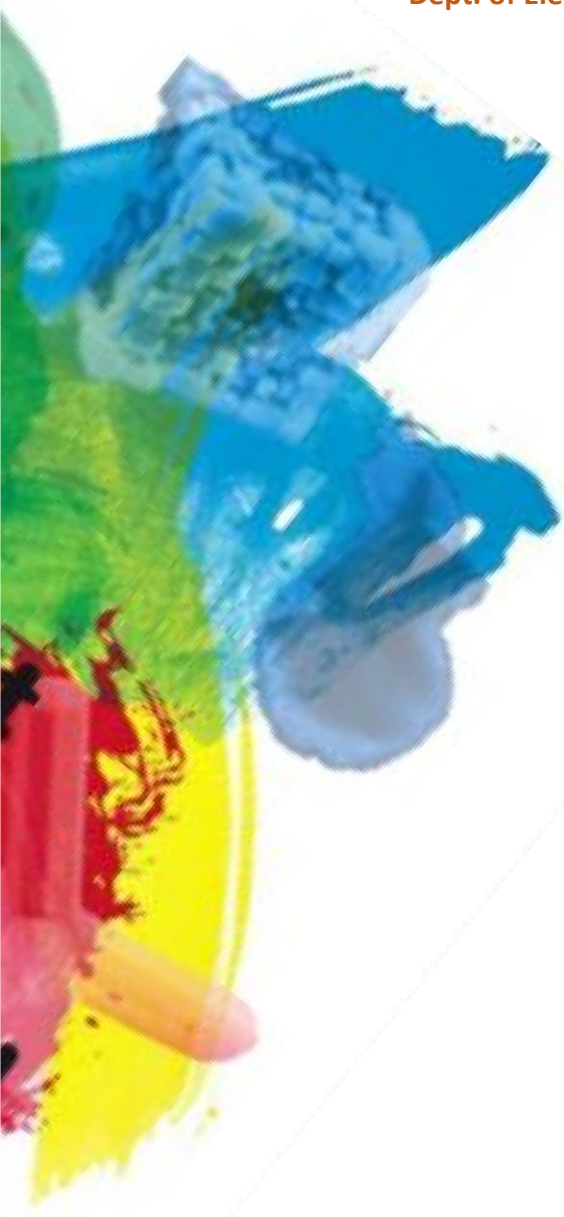

The World Health Organization (WHO) has always stressed the importance of indoor air quality (IAQ) and the potential danger of pollutants emitted from indoor sources; thus, it has become one of the main determinants for health. Therefore, the detection and monitoring of these pollutants is of paramount importance to mitigate health risk.
While society is becoming more and more concerned about the environment, healthy lifestyles and safety at work, current technology is failing at providing a personal solution suitable for a massive, widespread use. On one side, we find high-end gas analysers, very effective but very expensive, bulky and difficult to operate, and only meaningful for high-risk industrial applications. As an alternative, there exist many different electronic sensors (semiconductor, electrochemical, catalytic, etc.), attractive in terms of cost but only suitable for a limited set of gases; they are prone to trigger false positive signals (i.e. poor selectivity) and require frequent servicing and calibration.
In recent years, many efforts have been devoted to the development of enabling gas sensor technologies to monitor these selected pollutants and others2–5. Despite many of them put the focus on the miniaturization and reduction of power consumption, most ignore one of the main limitations of any gas sensor: the ability to assess unequivocally the analyte, i.e. specificity.
Concerning specificity, **colorimetric methods** put at our disposal a wide arsenal of compounds and reaction mechanisms to address specific gaseous molecules. A colorimetric indicator is a substance that develops light absorption at specific wavelengths in the presence of the target substances. These techniques are widely spread in analytical chemistry and offer unbeatable levels of selectivity and specificity towards the target species.
In this seminar, I will review the recent developments and trends in colorimetric-based gas sensors, their advantages, and limitations and finally, new approaches and configurations for next generation of gas sensor technologies.

Kindly invited.