337

UNIVERSITÀ DEGLI STUDI DI ROMA
"LA SAPIENZA"
DIPARTIMENTO DI CHIMICA

SEMINARIO DI DIPARTIMENTO

Settembre 2005

Lunedì 19 Settembre 2005 ore 15:00 in Aula B (VEC)

Prof. John P. Dakin_Optoclectronics research centre, University of Southampton, UK

"OPTICAL GAS SENSING BY DIRECT SPECTROSCOPY AND BY USING INDICATORS."

Gas sensing in the ORC, at Southampton University

(Correlation spectroscopy and indicator chemistry methods, mainly over optical fibre paths)

The first part of the lecture will describe recent work at Southampton University on gas sensing with correlation spectroscopy (CS). This is a highly- selective method of detecting or measuring gases with low "crosstalk" to other gases, enabling it to be applied to complex mixtures. The method essentially compares the spectrum of a gas to be measured with its known spectrum in order to "fingerprint" it. Real-time CS performs an optical comparison of the measured gas absorption spectrum with that of a sample of the target gas in a reference cell. The work at Southampton examined many ways of doing this, with the most recent work being with switched optical sources, with simple optical, or optical fibre, networks, followed by electronic signal processing of detected signals to compare the spectra. Experimental systems, results and an outline of our theoretical analysis methods will be discussed.
The second part of the lecture will describe measurements using indicator chemistry.
Here, a chemical indicator is entrapped, at or near the end of an optical fibre, and interrogated optically. The Southampton work will describe sensing using monitoring of fluorescent decay lifetime, with intensity-modulated excitation sources, and how the sensor membrane can be constructed with anti-fouling properties, as may be desirable for many real-world systems, e.g. in river, marine and biological media.

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