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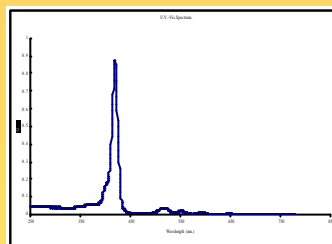
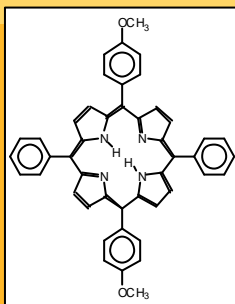
Nanogravimetric gas sensor for the detection of alcohols.

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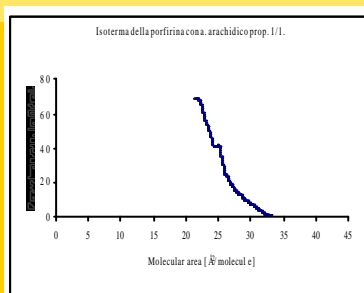
Porphyrins constitute a large class of compounds involved in many fundamental processes such as metabolic procedures (heme) or photosynthesis (chlorophyll). These compounds are characterised by a peculiar arrangement of four pyrrol-type residues linked together by four methinebridging groups. Peripheral substitution could induce (semi)-amphiphilic properties to porphyrins, thus rendering them suitable for the deposition of thin films by the Langmuir-Blodgett (LB) technique. These films can be used as the active layer in gas-sensors.

Their interaction with gas molecules depends on film morphology, and especially on porphyrin structure and arrangement.



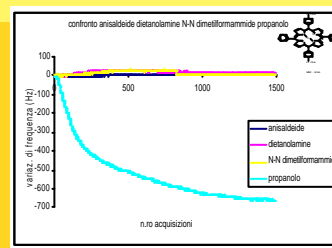
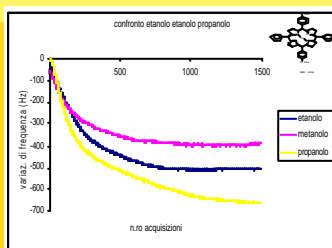
Max	Values
WL	ABS
645.50	0.0073
590.50	0.0115
551.00	0.0180
514.50	0.0375
418.50	0.8780

The simultaneous presence of heteroatoms (O and N) and delocalised π electrons causes a peculiar electronic distribution within the π system. The interaction of this π density with gas molecules in the surrounding atmosphere induces changes in some of its physical and chemical parameters.



L.B. isotherm of $H_2TPP(OCH_3)_4$ / arachidic acid in $CHCl_3$, phase transition 30 mN/m. Limited area 25.5 Å²/molecule.

As an example quartz crystal microbalances (QCM) translate a variation of the mass of the active layer, due to the adsorption of the gaseous analyte, into a variation of the oscillating frequency of the QCM.



Conclusions.

From the tests with the nanogravimetric balance (EQCM), result that the sensor system porphyrinesquartz, is sensible at the presence of alcohols, but no other organic compounds (fig.5). Very interesting is to note the different frequency variation when used different alcohol (fig.4) in acquisition got in the same conditions.

References.