

## PASSIVE SENSOR FOR IN SITU DETECTION OF AMINES IN CHEMICAL INDUSTRIES

### INVENTION DESCRIPTION

Nitrogenous compounds such as ammonia and aliphatic amines are particularly hazardous air pollutants due to its toxic and odorous characteristics. Aliphatic amines found in high concentrations in air are the result of their extensive use in certain types of chemical industry, used for example as raw materials or intermediates in the preparation of fertilizers, pesticides, surfactants, pharmaceuticals, polymers, dyes, etc.. For the determination of amines in situ and in real time, one possibility is to use active sampling techniques, although these techniques often depends on an external source of energy, specific equipment for sampling and, in some cases, energy costs to consider. Regarding passive sensors, there are few options for detecting amines and all have drawbacks such as the need for pretreatment prior to use, or excessively high detection limit, which prevents their use in real atmospheres with low concentration of amines.

Researchers at the Universitat de València have developed **passive colorimetric sensor for *in situ* detection of amines in air** with detection limits up to  $3 \text{ mg/m}^3$ , making it suitable to use in the detection of amines in real atmospheres.

The sensor embedded in a malleable and manageable silicone matrix, is a passive sensor which does not require any kind of pre-treatment, or power supply or external instrument. The sensor is further characterized by its safety to the environment, its stability against a wide range of temperatures and to humidity and solar radiation, and its resistance to reversion, so that the sensor response is stable over time.

### BUSINESS APPLICATION SECTORS

The sensor developed is applicable in **personal and collective safety** systems, **environmental control** systems for the detection of aliphatic amines in air, produced in many **chemical companies**, and for the control of aliphatic amines due to the degradation of foods, especially fish, useful for **food industries**.

### TECHNICAL ADVANTAGES AND BENEFITS

The main advantages are:

- Simplicity and ease of use: it is a passive colorimetric sensor that does not require any kind of pretreatment or power supply or external instrument.
- Low cost: simple fabrication process without high costs
- Low detection limits: suitable for use in real atmospheres, of the order of  $3 \text{ mg/m}^3$ .
- Quantitative detection: direct quantitative detection can be carried out by diffuse reflectance of the sensors.
- Stability: against a wide range of temperatures and to humidity and solar radiation. Reversion resistance.

### DEVELOPMENT STATUS OF TECHNOLOGY

The technology has been validated in laboratory, and currently the research group is working on its development.

### INTELLECTUAL PROPERTY RIGHTS

The technology is protected through the following patents:

Spanish patent application P201300436 and PCT/ES2014/000077 application, titled "Dispositivo pasivo para la detección y/o determinación in situ de aminos en gases".

### COLLABORATION SOUGHT

- License agreement, manufacturing or marketing.
- R & D project to complete the development or apply to other sectors.
- Subcontracting agreement with another company.
- Possible spin-off (looking for partners)

## PASSIVE SENSOR FOR IN SITU DETECTION OF AMINES IN CHEMICAL INDUSTRIES

### RELATED IMAGES



Image 1: Colorimetric sensor response



Image 2: Image of the sensor

### CONTACT

Oficina de Transferència de Resultats d'Investigació (OTRI)  
Universitat de València  
Avda. Blasco Ibáñez, 13, nivel 2  
46010, Valencia  
Tel: 96 386 40 44  
e-mail: [otri@uv.es](mailto:otri@uv.es)  
Web: [www.uv.es/otri](http://www.uv.es/otri)