

Sensing membranes based on CNT nanocomposites processing for air and water monitoring

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ABSTRACT

Hereby we report on design of an aerial monitoring platform equipped with sensors for detection of specific contaminants, named AWISEM (Air-Water Innovative System for Environmental Monitoring). The AWISEM system is aimed to be a mobile aerial and aquatic vehicle which should contain: A) an aerial and aquatic mobile monitoring platform, with an innovative sustentation system, having the capability to fly and also to float in an aquatic environment; B) two distinct sets of sensors, based on CNT composites with high sensitivity for the monitoring of either aerial or aquatic contaminants. An important part of this work consists in producing and characterizing sensing membranes (thin layers) for two types of sensors able to detect contaminants such as ammonia - in air and nitrites - in water. These membranes are produced by matrix-assisted pulsed laser evaporation technique. The morphological investigations showed specific structures ("worm"-like, rods, grains) while EDX investigations revealed that all constitutive elements (C, O, Fe, W) of used compounds (CNT, C₃₂H₁₆FeN₈, WO₃) are present in the corresponding nanostructured layers.

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