

IMEM-CNR, Webinar – 13/06/2022, ore 11:30

Seminario su

Sensors for explosives, NATO project UnExploDe: Unmanned Explosive Detection, Nitroaromatic explosives detection in air by amino-functionalized carbon nanotubes

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Nitroaromatic explosives are the most common explosives and their detection is significant in public security, human health and environmental protection. In particular, the detection of solid explosives by revealing the presence of their vapors directly in air would be very desirable for compact and portable devices. Amino-functionalized carbon nanotubes are used to produce resistive sensors to detect nitroaromatic explosives by interaction with their vapors. Devices formed by carbon nanotube networks working at room temperature revealed tri-nitrotoluene, one of the most common nitroaromatic explosives, and di-nitrotoluene saturated vapors, with reaction and recovery times of few seconds and few tens of seconds respectively. This type of resistive device is particularly simple and can be easily combined with low power electronics for preparing portable devices. A discussion about the possible detection mechanisms is made.

Recent results about the TNT detection by germanium nanowires will be also presented.

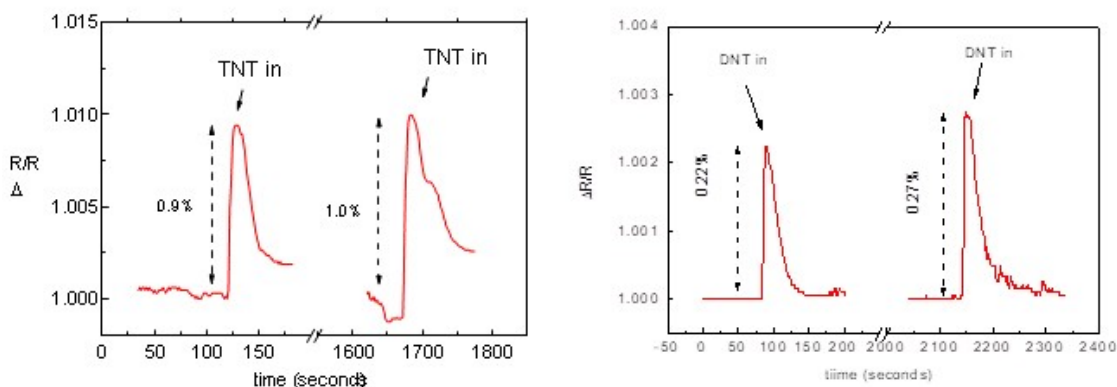


Figure 1

Repeated changes in resistance of the NH₂-C₂-MWCNT based sensor under a rapid flux of TNT-saturated and DNT-saturated N₂ gas. The sensor resistivity corresponded to 1.7 kΩ