Abstracts

Development of RF carbon nanotube resonant circuit sensors for gas remote sensing applications

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We present the design, development and analysis of highly sensitive and ultra-fast responsive electromagnetic microwave resonant sensors for monitoring the presence of gas. These novel sensors consist of circular electromagnetic resonant circuits coated with single and multi walled carbon nanotubes (SWNT & MWNT) that are highly sensitive to adsorbed gas molecules. Upon exposure to ammonia, the electrical resonant frequency of the sensor exhibits a frequency shift of as high as 6.25 MHz. The recovery and response times of these sensors is nominally 10 minutes when operating at room temperatures. This sensor technology is suitable for designing remote sensing systems to monitor gases inside sealed opaque packages and for environmental conditions that do not allow physical wire connections.

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