

Graphene Based Electronic Sensors for Gas and Volatile Organic Compound Detection

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A real-time graphene resistor sensor array (**Figure 1**) for the detection of gases was fabricated using traditional lithography techniques and tested using a novel gas sensing system. Graphene's excellent electrical conductivity, room temperature operation, biocompatibility and easy surface modification make it an ideal candidate for gas sensing applications. The use of chemical vapour deposition graphene as the sensor platform allows greater potential for more sensitive detection than similar sensors based on carbon nanotubes, gold or graphene oxide platforms. The graphene sensor exhibits a detectable change in resistance as molecules adsorb onto the surface or dope the graphene. Resistance increases are observed with exposure to ammonia gas and decreases are observed with exposure to nitrogen dioxide gas. Sensor response increases with copper phthalocyanine functionalized graphene sensors. The approach described here provides an alternative sensing platform that can be used in gas sensing applications.

Figures

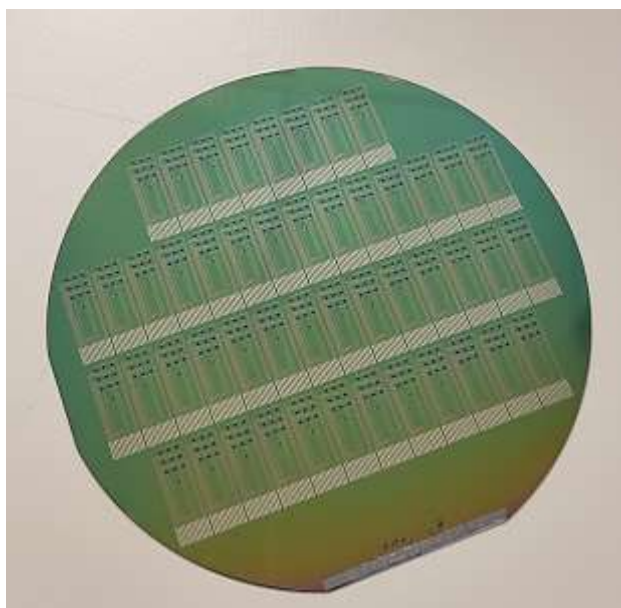


Figure 1: Full 4" Si/SiO₂ CVD graphene wafer of 3x3 graphene array devices.