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## The Chemiresistive Functionalization of Carbon Nanotubes for Gas Detection

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### **Abstract:**

Chemical detection has vast applications, from health to environmental to industrial monitoring. In chemical detection, chemiresistive sensors, which sense the change in resistance between two points from the binding of an analyte, are favored due to their simplicity, rapidity, low cost, low power consumption, and high precision. Carbon nanotubes (CNTs), due to their high surface-area-to-volume ratio, high stability, and electrical resistance's sensitivity to analytes, are advantageous over other materials used in gas sensing. This study will look at various functionalizations by carboxylic acid and various polymers of multi-walled carbon nanotubes for the detection of ethanol, ammonia, and nitrogen dioxide.