

**Electric response of MWCNs Nanoelectrode to
the chemical environment**

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We demonstrate the characteristics of individual metallic multi-walled carbon nanotubes (MWCNTs) as versatile sensors. MWCNTs nanoelectrode is able to detect sensitively the effect of a catalytical and chemical properties. Upon exposure to chemical solution such as HCl, the electrical resistance of MWCNT is found to change. Here we used chemicals such as 0.004% H₂O₂, pH2 HCl and pH10. A drop of 0.004% H₂O₂ solution on the MWCNT surface increased conductance, pH2 HCl decreased conductance but pH10 solution with HCl and KOH did not affect the conductance. We can guess these phenomena are due to the change of the density of the free charge carrier, schottkey barrier and workfunction on CNT surface through chemical adsorption. The small size and capability of these MWCNT nano electrodes for highly sensitive and real-time electrical detection will find its application in pH sensor as well as sensors for biological reaction such as enzyme reaction.