# A Polyaniline-based Sensor for the Detection of Formaldehyde


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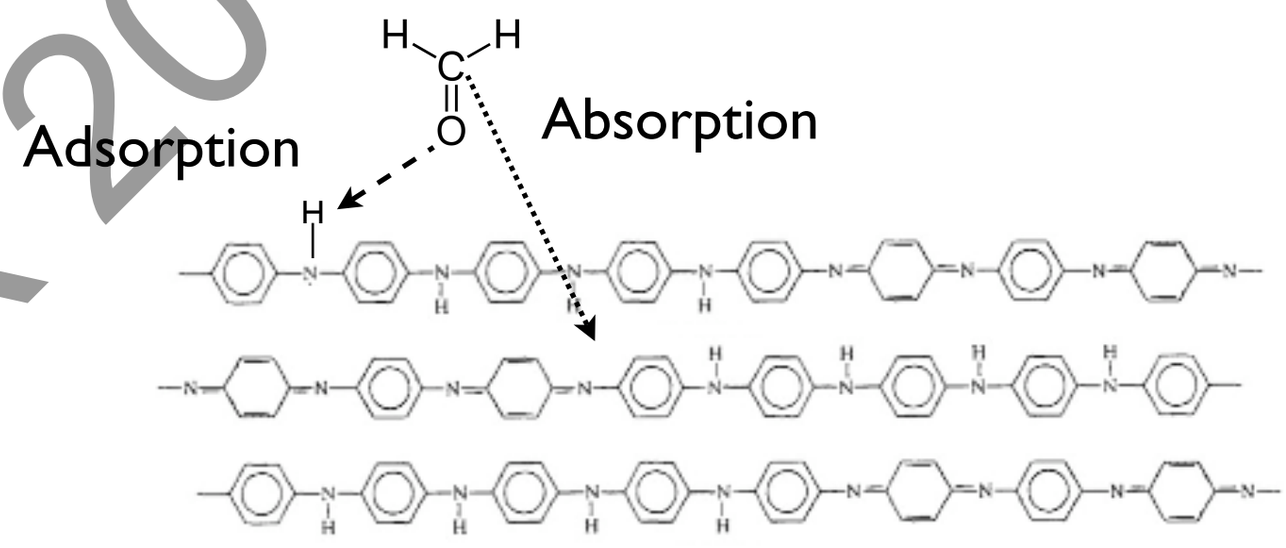
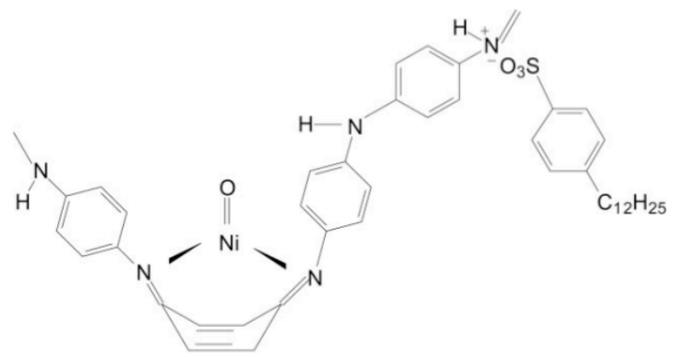
# Sensing Materials and Dopants

## Sensing Characteristics

- Sensitivity
- Selectivity
- Crystallinity
- Sensing mechanism
- Dopants

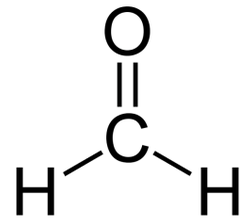


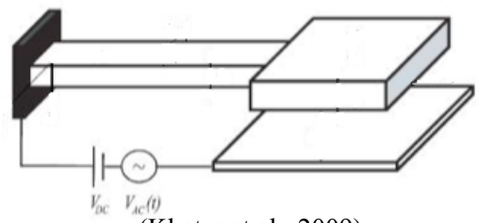
*(Han et al., 2006)*

# Developing a Sensor

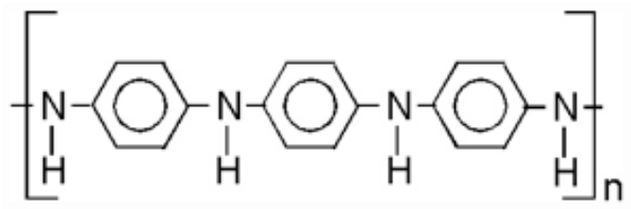
- Analyte?
  - Formaldehyde
- Detection limit?
  - 0.08 ppm
- Type of sensor?
  - Microbalance
- Sensing material?
  - Polyaniline (PANI)
- Dopants?
  - NiO and/or $Al_2O_3$




Maximum exposure level for formaldehyde over a span of 30 minutes is 0.08 ppm (WHO)

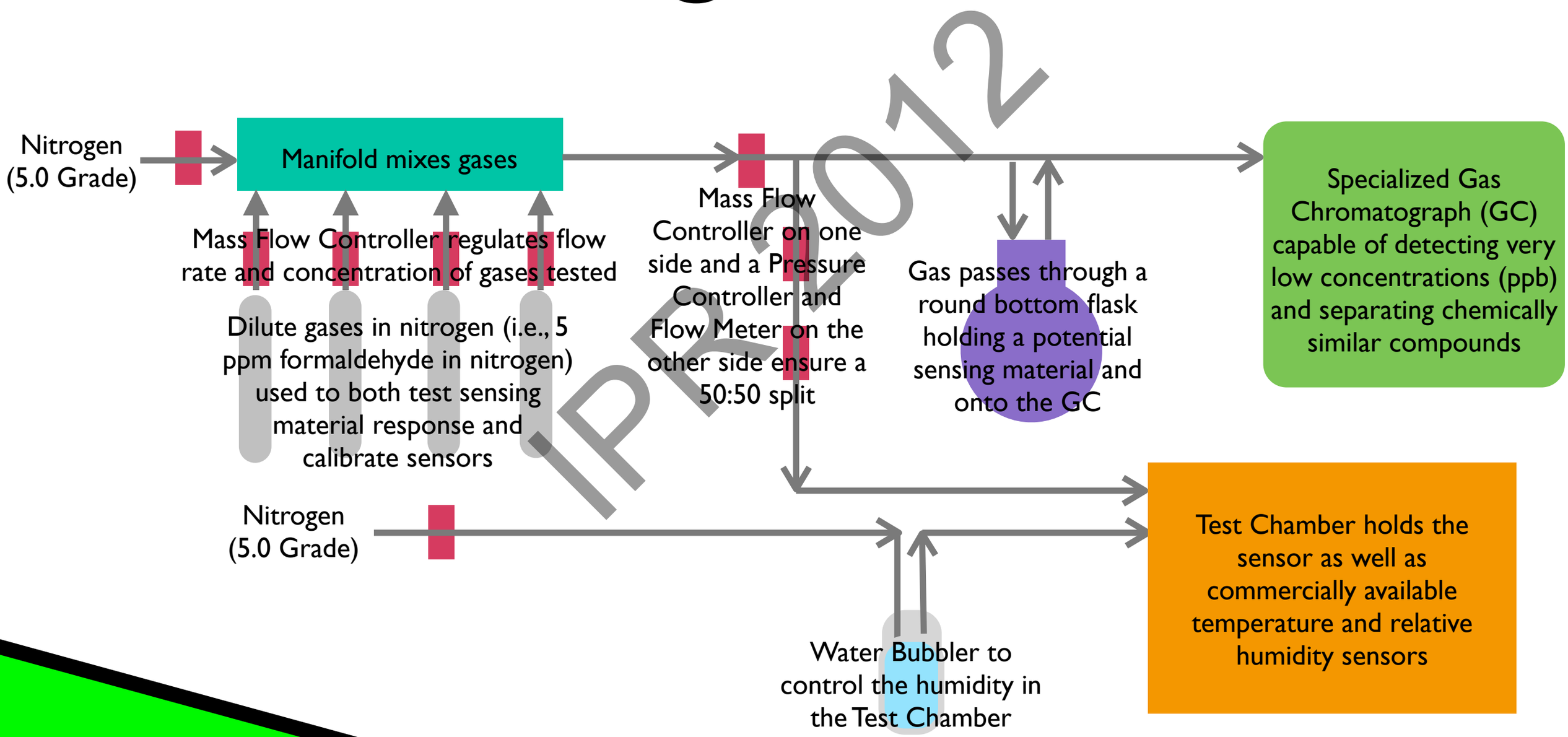


(Khater et al., 2009)

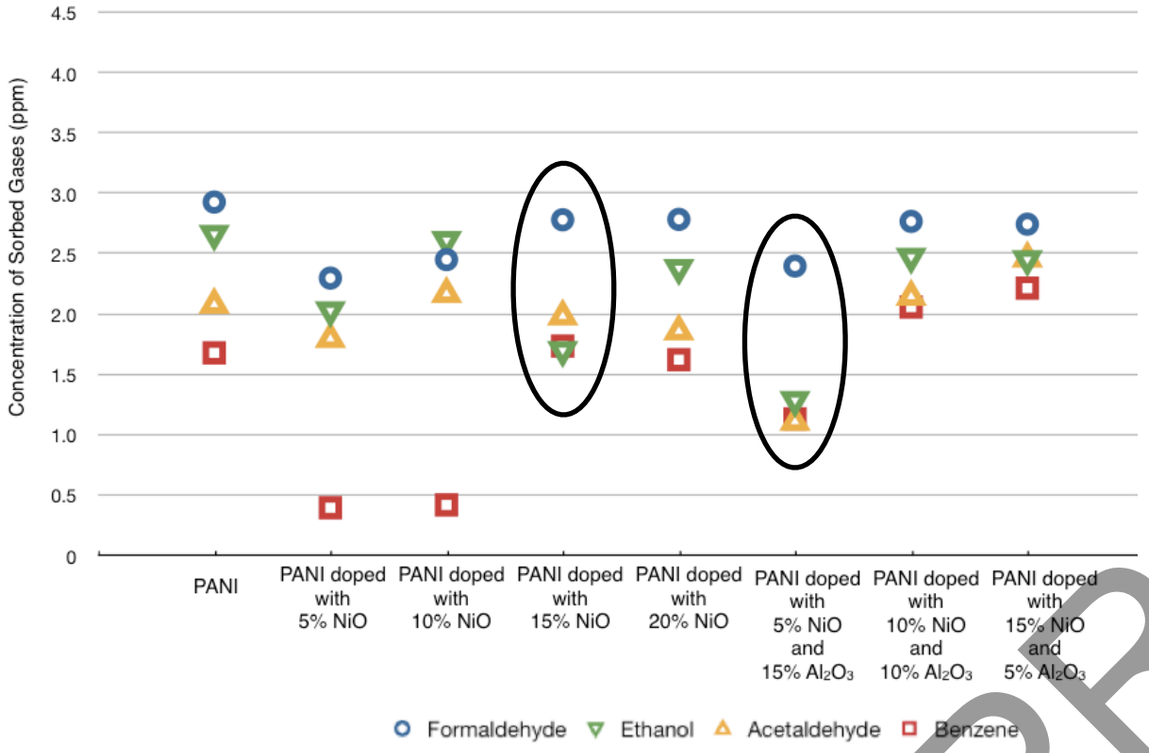



NiO and $Al_2O_3$ were chosen to increase both sensitivity and selectivity.

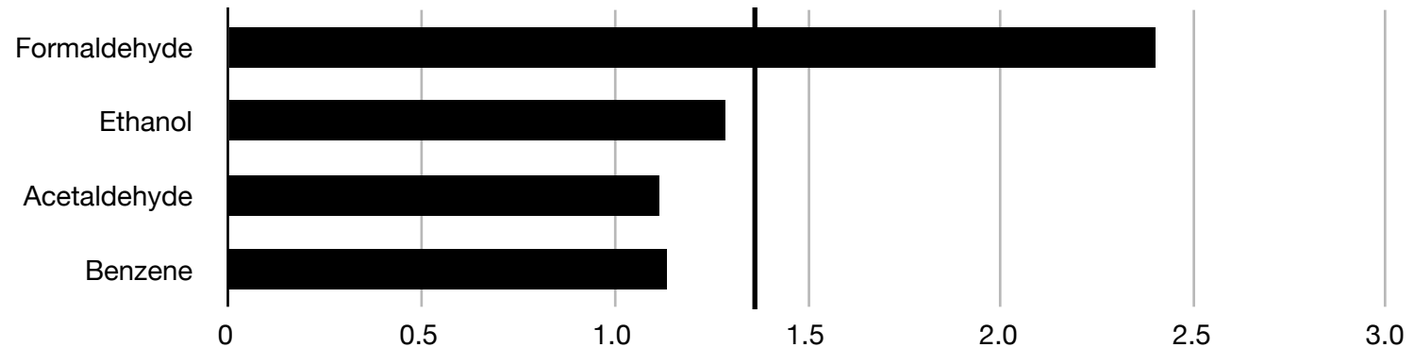
# Testing Potential Sensing Materials



# Results




- Eight potential sensing materials were tested for formaldehyde
- Two materials were chosen to be deposited onto the sensor and tested further
- PANI doped with 5% NiO and 15% $Al_2O_3$ had good selectivity towards formaldehyde




PANI doped with 5% NiO and 15% $Al_2O_3$