Development of Graphene Oxide Based Capacitive Gas Sensor for NO_2 Detection

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Parallel plate capacitive gas sensor was assembled using Graphene Oxide (GO) as the transducer material. The sensor was tested with NO_2 as the target gas. GO was synthesized according to the Improved Hummer's Method (Tours Method) in which vein graphite was sufficiently oxidized. Synthesized graphene oxide was characterized by Fourier Transform Infrared Spectroscopy (FTIR) and Thermogravimetric Analysis (TGA) ascertaining that products were well oxidized. Sensor was tested for capacitance variation in the frequency and time domains under the influence of constant temperature ramp. The results showed an average response time of about 2 minutes to reach the steady state signal and an equal time to reach the initial reference signal levels once the testing chamber was evacuated of the target gas.