



- ✓ **SENSOR CALIBRATION**
- ✓ **ACCURATE FLOW CONTROL**
- ✓ **EASY TO USE**

A SOLID BUSINESS CASE IN COLLABORATION WITH THE "ZHEJIANG UNIVERSITY"

GENERAL INFORMATION ABOUT THE PROJECT



TARGET OF THE PROJECT:

High sensitive reduced graphene oxide-based room temperature ionic liquid electrochemical gas sensor with carbon-gold nanocomposites amplification



DEPARTMENT:

Biomedical Engineering



HEAD OF PROJECT MANAGEMENT:

Ping Wang



ROLE OF MCQ INSTRUMENTS:

To control the flow rate and mixing gas in a very easy manner.

MORE INFORMATION ABOUT THE HEAD OF THE PROJECT

Zhejiang University (ZJU) is one of China's top higher education institutions, as well as one of its oldest; its roots can be traced back to 1897 and the founding of the Qiushi Academy.

Laying claim to several areas of research strength, ZJU currently ranks among the top three on Chinese mainland and within the top 100 in the Times Higher Education World Reputation Rankings and QS World University Rankings.

DESCRIPTION OF THE APPLICATION AND THE TARGET

Gas sensors have received extensive attractions due to their critical roles in environmental monitoring, industry manufacture and human safety. This paper for the first time introduces carbon-gold nanocomposites on a reduced graphene oxide based electrochemical gas sensor for high sensitive gas detection. Carbon-gold nanocomposites (CGNs) were synthesized by glucose carbonization and gold nanoparticles deposition using the hydrothermal method. Reduced graphene oxide (RGO) was electrochemically deposited on a screen-printed gold electrode with subsequent modification of CGNs. To achieve long lifetime and good stability, thin-film room temperature ionic liquid (RTIL) was utilized as the electrolyte featuring negligible

evaporation and large potential window, thus implementing the high sensitive RTIL-based electrochemical gas sensor. The amplification effect of RGO and CGNs modification was investigated using cyclic voltammetry, chronoamperometry and transient double potential amperometry (DPA), which reveals the significant enhancement of sensor performance by synergic application of RGO and CGNs. The sensor was calibrated for oxygen detection from 0.42% to 21% with good sensitivity and linearity. The reproducibility of the sensor using chronoamperometry and transient DPA was also studied with excellent reproducibility. The study paves a new way to implementing high sensitive electrochemical gas sensors for rapid monitoring of gas exposure.

BENEFITS AND SAVINGS



GAS MIXER VS MASS FLOW:

The GAS MIXER channels it's more compact than typical flow controller meters and can be specifically calibrated on the mixture to be used.



FLOW RATES: **NO CUT-OFF**

MCQ GB100 Series allows you to control the flow in all the calibration range, from 0.1 mL/min to 500 mL/min with NO cut-off



TIME SAVINGS: **-70%**

Easier setup management of the hardware. Easier setup management of the software.



SOFTWARE **AUTOMATION**:

Thanks to our Software PRO Version and its option "Automatic Program", now the Zhejiang University can bring forward experiments in automation.



SUCCESSFUL ACHIEVEMENT:

We helped the Zhejiang University to get highly precise and stable micro flows of gas to calibrate sensors in a easy way thanks to our instrument and software.



FLOW STABILITY:

Thanks to our revolutionary method every gas flow has a great stability making possible to have a stable flow also for lower flow-range.

READY TO TALK ABOUT YOUR SOLUTION?

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