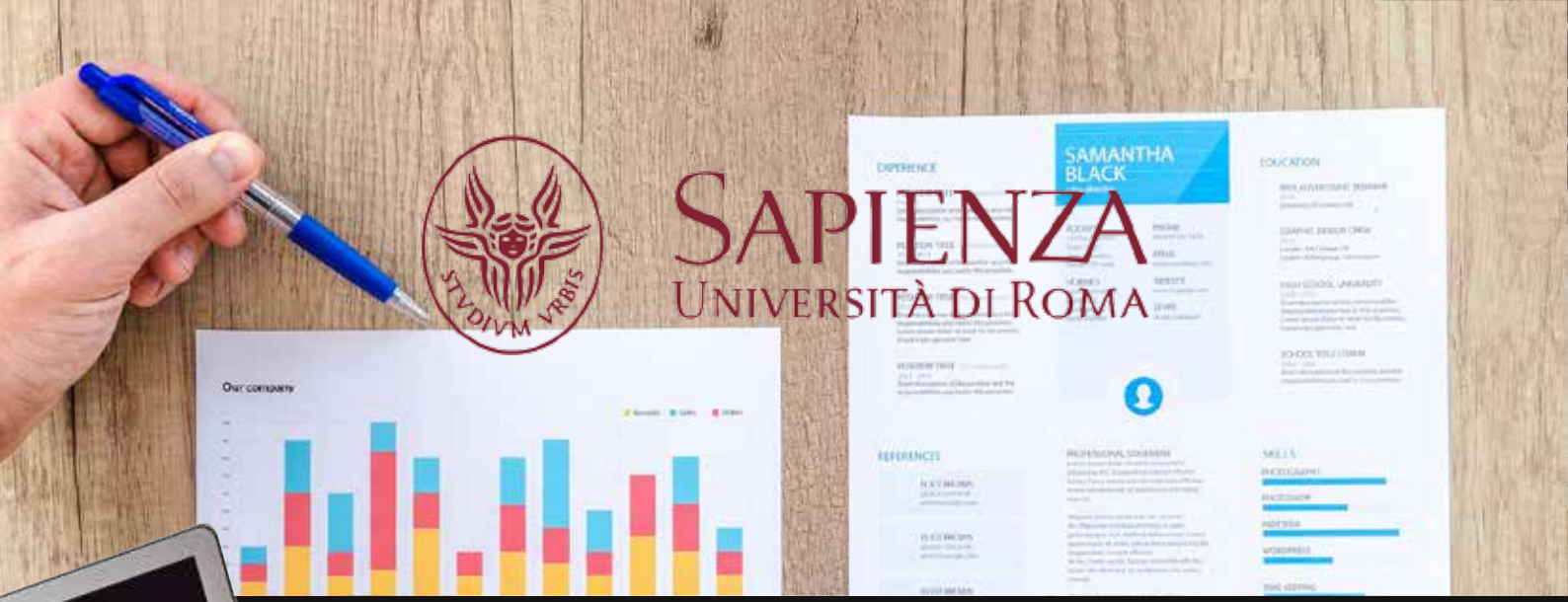

A SOLID BUSINESS CASE IN COLLABORATION WITH
L'UNIVERSITA' DEGLI STUDI DI ROMA "LA SAPIENZA"

GENERAL INFORMATION ABOUT THE PROJECT

TARGET OF THE PROJECT:
Semiconductor Photocatalysys

DEPARTMENT:
Deparment of Chemical, Materials, and Environmental Engineering

HEAD OF PROJECT MANAGEMENT:
Dr.ssa Maria Laura Santarelli - marialaura.santarelli@uniroma1.it

ROLE OF MCQ INSTRUMENTS:
A revolutionary KEY ROLE that made the whole project possible

MORE INFORMATION ABOUT THE HEAD OF THE PROJECT

Maria Laura Santarelli, Chemist, PhD in Engineering. Lecturer at the Universita' degli studi di Roma "La Sapienza". Researcher. She published various international and national scientific papers. More than 20 years of experience in research for the science of polymers, materials and petroleum derived. Recently she added in her experience the best practices for the study of the Materials for Optoelectronic and Graphene.

DESCRIPTION OF THE APPLICATION AND THE TARGET

Standard dictates to measure the overall capacity of the photocatalyst in removing the nitrous oxide, NOx, using and air flow containing NO and NO2 (1ppmv) within an average test time of 5,0 h in lighting condition and with a flow rate of 1.5 L/min. The level of exhaust used is about 500 ppbv. Given the low stability and the difficulty to find gas test cylinder in such low concentrations, we decided to use standard Mass Flow Controller to reduce through mixing ultrapure air at 500 ppbv of NOx tanks as balance with standard cylinders with a concentration of 400 ppmv of NO and 400 ppmv of NO2. Although, a dynamic preparation of gas mix of this type and composition control of the mix itself with a Mass Flow Controller resulted mediocre due to the long response time and the high instability, for the long duration of the test (5h), in controlling low flow rate which, in time, led to inaccurate estimates of the efficiency of the photocatalyst and to the non reproducibility of standard test conditions. The using of the MCQ GB100 Series allowed to obtain the desired concentration within the photoreactor with a flow rate of 500 mL/min using ultrapure dry Air as balance gas and a NOx mix as solute.

BENEFITS AND SAVINGS

A traditional method would require at least 2 mass flow controllers, an external control unit, a power supply, and a tubing system, plus a massive investment of time in pre-mixed ppb gas cylinders. This obsolete method would not neither solve the problem at its roots, because of a huge waste of time in gas delivering, and a substantial impossibility to diluite desired gas ratios with a certain stability.
With MCQ Instruments, the Universita' La Sapienza required only a single Gas Blender 100 Series device and its Software in Pro Version. The simple combination of these two factors has made possible an exponential number of experiments, reducing time, efforts, investments and collecting much more results. In pills:

COST SAVINGS: -30%

The effectiveness of our Gas Blenders reduces consistently the gas consumption of 30%

MICRO FLOW RATES: NO CUT-OFF

From their 3 L/min they are now able to reach flows rates of 100 mL/min, with a fast modularity.

TIME SAVINGS: x1000

Because of a weak dilution stability, before La Sapienza did reach only 1 success in 15 days. With MCQ they get it in 20 minutes.

SOFTWARE AUTOMATION:

Thanks to our Gas Creator Software now La Sapienza can bring forward experiments in automation, painlessly.

MICRO DILUTION: 1:1000

Thanks to our Gas Blenders they reached a stable flow dilution from 400 ppm to 500 ppb. Easily!

FLOW STABILITY:

Thanks to our revolutionary method every diluition can have a great stability making possible to bring forward experiments for hours with no surprises.

READY TO TALK ABOUT YOUR SOLUTION?

info@mcqinst.com - www.mcqinst.com