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## **A PRELIMINARY STUDY ON ELECTROCATALYTIC CONVERSION OF CO<sub>2</sub> INTO FUELS**

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### **Abstract**

The CO<sub>2</sub> electroreduction in gas phase using Pt on carbon black catalysts is investigated in this work. This process is expected to become a key technology to prevent anthropogenic CO<sub>2</sub> emissions. Specifically, the electrocatalytic reduction in a solventless gas phase is studied, as a first approach to later develop a photoelectrocatalytic device for the efficient conversion of CO<sub>2</sub> to fuels using solar energy for the reaction. The objective of this preliminary work has been the tuning up of the experimental setup and the development of the analytical method. To determine the reaction products three different configurations have been tested. The configuration consisting in the absorption of the reduction products in a cold trap with decane and the injection of both liquid and gas phases from the cold trap in a GC-FID-TCD allowed identifying several reduction products such as methanol, acetone, isopropanol, methyl acetate, hydrogen, and carbon monoxide. Further, it has been found that hydrocarbons such as ethylene, ethane, methane, propylene, propane, butane or pentane are not quantitatively formed during the process at conditions used in this work.

*Key words:* CO<sub>2</sub> recycling, energy compounds, electrocatalysis, electroreduction

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