DBD PLASMA CATALYSIS PROCESS FOR CARBON RECOVERY

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Since many years carbon dioxide reduction by hydrogen through catalyst processes is a usual way from the Paul Sabatier reaction to produce CH4. this process is able to be done from thermal process by using an heterogeneous catalyst such as zirconia cerium support with nickel sites for the hydrogen reduction of CO2 .However this reaction is well working (85%-90%) at 350°c and its selectivity depends of the secondary reactions such us carbon monoxide or carbon deposit which appears above 350°C.

Our goal is to point out that the cerium oxide is a N semiconductor while Nickel sites are a P semiconductor and by that way we have a N-P semiconductor so the bimetallic catalyst is able to produce electrons for the CO2 reduction when the DBD plasma polarize the ceramic in the small pores of the bulk of the pellet (plasma appears inside the pore) We have *demonstrated an electro catalyst process working at room* temperature with a high efficiency close to 85% -90% and a selectivity of 100% . The exothermal reaction of the reduction increases the temperature of the reactor until 120°C without any secondary reactions (CO,Carbon deposit)and points out the role of the N-P semiconductor as the key step for the electron flow to reduce the CO2 into CH4 .