

Abstract Submitted
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Synthesis of liquid hydrocarbons from CH₄ / CO₂ in a atmospheric pressure Dielectric Barrier Discharge GIORGINA SCARDU-ELLI, GRAZIANO GUELLA, DANIELA ASCENZI, PAOLO TOSI, Department of Physics University of Trento Italy — The conversion of natural gas into more useful compounds, represents one of the present-day most attractive goals. Particularly relevant is the dry reforming process that realizes the simultaneous conversion of methane and carbon dioxide into syngas. Since CH₄ and CO₂ are both greenhouse gases, this process is of great environmental interest because it couples the advantages of an efficient transformation of natural gas into useful chemicals with the potential positive effects on global warming related to CO₂ recycling. In a dielectric barrier discharge of CH₄/CO₂ at atmospheric pressure, in addition to syngas we have observed the formation of liquid chemicals. This is quite fascinating since the production of liquid fuels by CH₄ and CO₂ is a very attractive way to store and transport energy. The nature of the liquid has been investigated by using gas-chromatography, infrared spectroscopy and nuclear magnetic resonance spectroscopy. The non volatile component of the liquid products consists of a broad distribution of hydrocarbons, highly branched mainly by methyl groups. In addition we have observed the production of a minor amount (5%) of oxygenated compounds (tertiary alcohols, ketones, esters and carboxylic acids).

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