

**Natural gas conversion to light olefins in low-density plasmas.** Hamid, H.; Hammawa, H.; Aitani, A.; Sackinger, W. M. The Research Institute, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia. Proceedings of the World Petroleum Congress (2000), 16th(Vol. 4), 36-39. Publisher: Institute of Petroleum, CODEN: WPCPAU ISSN: 0084-2176. Journal written in English. CAN 145:295631 AN 2006:239680 CAPLUS (Copyright (C) 2008 ACS on SciFinder (R))

### **Abstract**

The value which may be added to natural gas, by its direct conversion to olefins, has prompted the low-d. plasma approach. A geometry was chosen in which conversion takes place in a large-surface-area electrode assembly, where methane ions combine with methane neutrals to produce C<sub>2</sub>+ gases. Bench-level expts. are reported on the direct, one-step conversion of methane to ethylene, propylene, and other light hydrocarbons, in a low-pressure plasma glow-discharge. Relative percentages of useful higher hydrocarbons in the output mixt. range up to 42% for ethylene, to 68% for ethane, and to 48% for acetylene. The relative proportions depend upon the pressure, the current, and the voltage across the plasma discharge. Conditions were established which favor the formation of one or two of these desirable compds., at the expense of the other light hydrocarbon products. The prodn. operations for which this technol. is intended would include a sepn. of the methane component in the output mixt., and its recycling in a feedback loop, to extinction, if no other uses were planned. Results are presented relating the yields of the preferred gases to the pressure and the elec. conditions.