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Comparison Study of Methane Conversion in Low Temperature DC Plasma Reactor with Catalytic High Temperature Fixed Bed Reactor¹ HAMID REZA BOZORGZADEH, NASER SEYED-MATIN, Research Institute of Petroleum Industry (R.I.P.I.), Iran, AMIN AZIZNIA, MORTEZA BAGHALHA, Department of Chemical Engineering, Sharif University of Technology, Iran — This work reports the results of oxidative coupling of methane in the presence of a $\text{Na}_2\text{WO}_4/\text{Mn}/\text{SiO}_2$ catalyst within the temperature range of 1023–1123 K and a low temperature, atmospheric co-axial cylinder DC corona discharge reactor. Catalytic high temperature reactions were conducted in a quartz tube reactor with $\text{Na}_2\text{WO}_4/\text{Mn}/\text{SiO}_2$ catalyst. A methane/oxygen feed ratio of 4:1 with argon as a diluent gas with total flow of 100, 130, 170 & 200 ml/min has been studied in this investigation for both methods. The plasma reactor was a 15 cm stainless steel co-axial cylinder which cylinder is grounded. Acetylene and hydrogen were the major products of co-axial cylinder DC corona reactor. In the catalytic reactor, ethylene has the highest selectivity and no trace of acetylene was found. The comparison between two methods is also discussed.

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