

SUGGESTIONS FOR FUTURE RESEARCH :

The mechanism proposed in this work has suggested that the surface is covered by series of carbonaceous intermediates under reaction conditions. The two most concentrated intermediates which contain carbon are RuCH_3 and RuH_2CH_2 . Two experiments could be performed to attempt to observe these intermediates under reaction conditions. Nuclear magnetic resonance and electron loss spectroscopy could be used to distinguish between these intermediates and to look for others which might be present in relatively high concentrations.

It would also be informative to extend this study to high pressure using a Berty reactor and a supported ruthenium catalyst. Several such studies have been made but none has covered a wide enough pressure range to demonstrate Langmuir-Hinshelwood kinetics. Also, it would be useful to vary the CO:H_2 ratio such that higher hydrocarbons are produced. The effect of this process upon the mechanism of the methanation reaction could be established, as well as the mechanism for the higher hydrocarbon production.