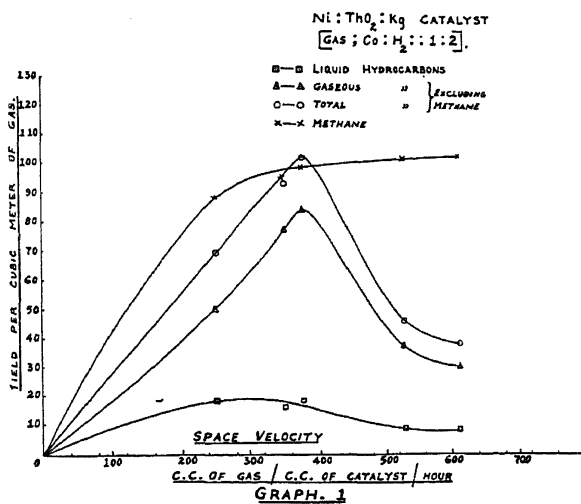
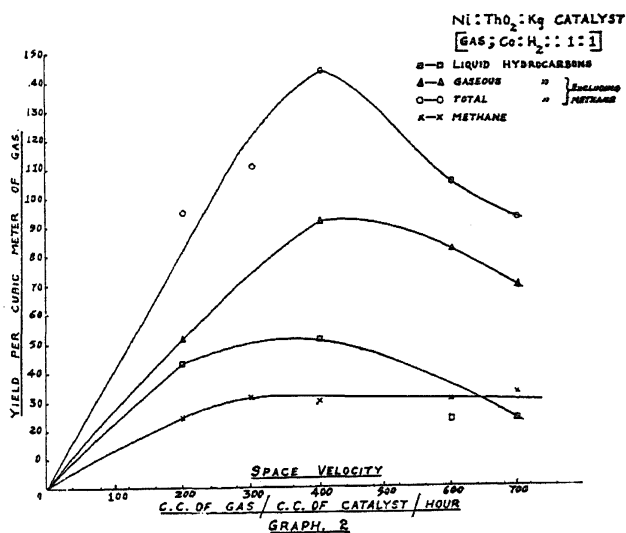


NI-THO₂-KIESELGUHR (100:18:100) CATALYST FOR THE FISCHER-TROPSCH SYNTHESIS AT MEDIUM PRESSURE PART III

It is well known that there are certain advantages in operating Fischer-Tropsch synthesis at medium pressure. A. J. Underwood¹ and C. C. Hall² have shown that the operating pressure (5-15 atms.) has an effect on the yield of hydrocarbons and increases the life of the catalyst. The use of medium pressure enables one to reduce the size of the plant. The medium pressure process is modified by Ruhrchemie, A. G. (1939), using the cobalt catalyst and gives a product containing a high proportion of olefines by using straight water gas.



The present investigation is undertaken to improve the Fischer-Tropsch Synthesis of hydro-



carbons economically by using the (1) cheaper catalyst, (2) medium pressure and (3) water gas instead of synthesis gas. The use of cheap Ni-catalyst promoted by Thoria and supported by Kieselguhr at atmospheric pressure has already been reported by Ghosh, Basak and Badami.³

The same catalyst has been tried at 70 lbs./sq. inch pressure using synthesis as well as

water gas. It is observed that the best reaction takes place at 205° C. in both the cases and the catalyst has been found to be very steady. When synthesis gas is used the yield of methane is found to be very high as shown in the graph. But with water gas the yield of methane goes down and there is a corresponding increase of gaseous and liquid hydrocarbons. The yields of hydrocarbons are plotted against space velocities, using synthesis gas (Graph 1) and using water gas (Graph 2).

J. C. GHOSH,
N. G. BASAK,
C. VENKATESAN.

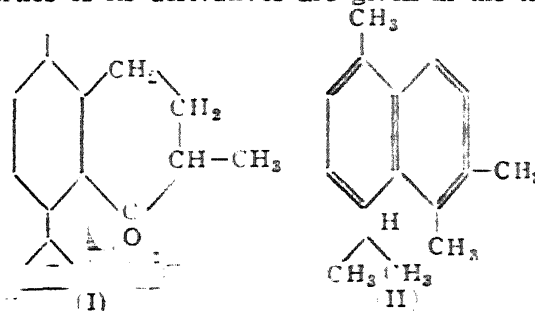
Dept. of Pure & Applied Chemistry,
General Chemistry Section,
Indian Institute of Science,
Bangalore,
November 1, 1947.

- 1 Underwood, A. J., *Ind. Eng. Chem.*, 1940, **32**, 449.
- 2 Hall, C. C., *J. of Inst. of Fuel.* 1947 **20**, 65,
- 3 Ghosh, Basak and Badami, *Chem. Sci.* 1947, **16**, 318.

STUDIES IN SESQUITERPENES PART II. SYNTHESSES OF METHYL CADALENES

In connection with our investigations on the sesquiterpenes of the cadinene group it became necessary to know the properties of all the possible methyl-cadalenes. In this advance communication we report the syntheses of the 5-methyl-, 8-methyl- and 3-methyl-cadalenes. The other two had been prepared previously by Campbell and Soffer.¹

5-Methyl-cadalene. 2, 5-Dimethyl-8-isopropyl-tetralone-1 (I) prepared from p-cymen² was treated with methyl magnesium iodide to give a mixture of the carbinol and its dehydration product. The mixture was completely dehydrated with 95 per cent. formic acid giving 1, 5, 6-trimethyl-4-isopropyl-7:8-dihydronaphthalene. Dehydrogenation of this hydrocarbon with selenium gave the required 1, 5, 6-trimethyl-4-isopropyl naphthalene (II). The properties of its derivatives are given in the table.



3-Methyl-cadalene. Toluene was condensed with methyl succinic anhydride in nitrobenzene in the presence of anhydrous aluminium chloride to give β-(p-tolyl)-α-methyl-propionic acid (III) (cf. Mayer and Stamm).³ The keto group of its ester reacted selectively with the magnesium methyl iodide to give γ-(p-tolyl)-γ, α-dimethyl-vinyl acetic acid. The unsaturated acid was reduced with hydro-iodic acid and red phosphorus to give γ-(p-tolyl)-γ, α-di-