

there been any extensive carbiding of the catalyst, was shown by another experiment in which the catalyst was deliberately carburized by passing carbon monoxide for nearly 32 hours at 200° to 250° C. Evacuation at 300° C., after this treatment, did not restore more than 25% of the original value for the chemisorption of carbon monoxide. The carbided catalyst was also found to be almost inactive in hydrocarbon synthesis. Only a little methane, but no higher hydrocarbons, was produced, possibly by the slow reduction of the carbide by the hydrogen present.

These researches, concerning the nature of the active substrate in the Fischer-Tropsch reaction lead to the conclusion that a chemisorbed complex of the reactants, such as CO-H, rather than a metal carbide, is the intermediate precursor to -CH<sub>2</sub>- groups. This view places us in agreement with the results of two recent investigations reported from the U.S.A. Employing the 'tracer' technique, Kummer, et al.,<sup>14</sup> have shown that "either ethyl alcohol or some surface complex formed by the adsorption of ethyl alcohol behaves as an intermediate in hydrocarbon synthesis over iron Fischer Tropsch cata-

lysts and that at least the first of the added carbon atoms attaches itself principally to the  $\alpha$ -carbon atom of the surface complex". Drawing a parallel between the formation of branched chain hydrocarbons and that of branched chain alcohols in an operating Fischer Tropsch unit, Weitkamp<sup>15</sup> concludes that the same mechanism operates in both cases.

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### OIL REFINERY TO BE ESTABLISHED IN BOMBAY\*

DURING his recent visit to the U.S.A. and U.K., Dr. Bhatnagar, who was entrusted with the task of exploring the oil refinery problem, held discussions with the Standard Vacuum Oil Company and Caltex in New York, and with the Burmah Shell and B.O.C. in London. These companies showed their willingness to start oil refineries in India and discussions were continued in India after his return. The proposal which has now been accepted by the Government of India is the result of this discussion. According to the agreement signed on November 30, the Standard Vacuum Oil Company of New York will instal a million ton oil refinery at Trombay, near Bombay.

To facilitate the project, the Government of India have given certain assurances to Standard Vacuum, including exemption from compulsory acquisition for a period of 25 years and exemption from certain provisions of the Industries (Development and Regulation) Act. Standard-

Vacuum on their part have assured Government that the refinery would be completed as early as possible, that an adequate number of Indian personnel will be trained in refinery operations for employment in the refinery and that byproducts of the refinery will be made available for subsidiary Indian industries.

The Company has already brought out to India a group of marine engineers and refinery experts who will collaborate with the Government of Bombay and the Bombay Port Trust officials for the necessary improvements in the dock and harbour facilities near the site where the refinery would be set up, and for the solution of other preliminary technical problems. The company hopes to bring the refinery into actual production within four years.

This is the first instance in which large-scale foreign investment is coming to India with a view to setting up a vital, new and complicated industry. Discussions are at the moment proceeding with other oil companies which may lead to additional refineries being established.

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