

Shanghai, China, January 16, 1940.

STRICTLY CONFIDENTIAL

3632

Subject: Synthetic Gasoline

Submitted by: A. Viola Smith, Trade Commissioner.

(Reference: Inquiry of Chemical Division, Sept. 29, 1939;
Supplementing Commercial Attache Arnold's letter
response of Nov. 17, 1939).

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The National Resources Commission of the Ministry of Economics of the Chinese National Government during 1939 established at Chungking, a factory for the manufacture of synthetic gasoline from a combination of tung and rape seed oils. The plant erected at a cost of Chinese \$500,000. is carrying out commercial production of research experiments previously conducted by the Sin Yuan Fuel Research Laboratory of the Geological Survey of China at Nanking in collaboration with the Research Institute of the Chiaotung University of Shanghai. (Refer to Special Reports Nos. S-104 and S-107 of March 2, 1937 and March 3, 1937, respectively, wherein reference was made to studies then being conducted). It is equipped chiefly with machinery made in China, interspersed with some units of used American machinery, notably a Worthington pump. As the quality of iron available in China is inferior and lacks uniformity, machinery manufactured therefrom easily overheats, thus causing undue corrosion, hence the factory has had considerable difficulty from this source. Its operations are in charge of two Chinese engineers graduates of the Massachusetts Institute of Technology.

The plant with a contemplated daily capacity of 1,000 gallons is operating only at half production and apparently cannot be stepped up to full production, until its engineers can overcome the difficulties of overheating being experienced with Chinese made machinery. The gasoline produced is stated to have about a 50 octane rating, to be satisfactory from the standpoint of

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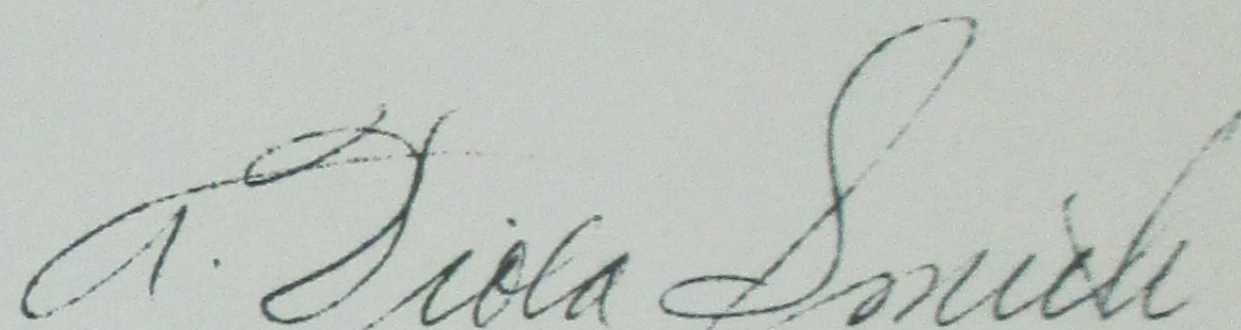
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cracking, but when burnt produces a very bad odor. The product is obtained by refining a vegetable oil mixture composed of 70% tung oil and 30% rape seed oil, the latter being mixed to overcome the gelatinous tendency which tung oil has when heated at high temperature. The gasoline so far produced acquires a gum when stored for any length of time, thus its main outlet of consumption is by motor busses operating in Chungking. Experiments are being conducted in the hopes of finding a feasible degumming method. Ordinary chemicals such as phenol or sulphuric acid could be used, but as none of these chemicals are produced locally and would have to be imported, the cost of this process is too expensive. Experiments are now being conducted in the hopes of discovering some other means of degumming.

Tung oil at Chungking is costing about Chinese \$20. for 50 kilograms, while rape seed oil is ruling at about Chinese \$60. for 50 kilograms. Imported gasoline in Chungking is selling under government permit at US\$6.00 per 5 gallon tin, or approximately US\$1.20 per gallon. The synthetic gasoline being produced from vegetable oils costs about 60 to 70% of imported gasoline. It is recognized that the cost of the synthetic gasoline is far too high in contrast to that of imported gasoline under normal conditions, but during war time, when transportation costs and currency exchange have so greatly raised the cost of imported gasoline, government authorities feel that the investment in this synthetic gasoline plant is worth while, as it may lead to finding a satisfactory fuel substitute. Chungking's consumption of gasoline is stated to be about 40,000 gallons of gasoline a month, and 3,000 gallons of lubricating oil. If the new plant can do nothing more than supply Chungking's needs, it will be contributing to the government's war time economy program. The erection of other plants in different localities are contemplated, if the Chungking plant proves sufficiently successful. As the factory has only been in operation a short time,

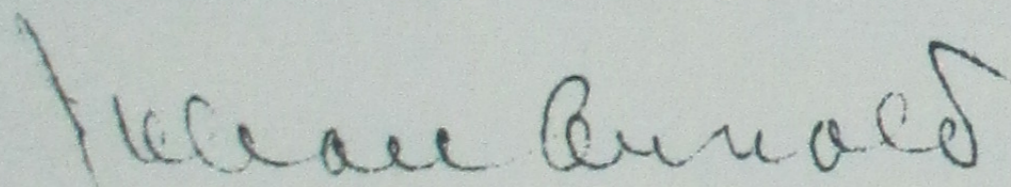
it is too early to determine how successful this synthetic gasoline may be in commercial use. Those in charge frankly state that its present production is economical only as a war time measure.

Experiments are now under way at the plant for the manufacture of gasoline from castor beans. Preliminary experiments are said to indicate that gasoline having a much higher octane content than that produced from tung oil has been obtained from castor beans. The scarcity of castor beans in Szechwan Province and the relatively higher costs may, however, preclude the feasibility of putting this method into commercial use.



A. Viola Smith,
Trade Commissioner

Approved for Transmission:



Julean Arnold,
Commercial Attache

SOURCE OF INFORMATION:

Data obtained when a personal visit was paid to the plant by Trade Commissioner A. Viola Smith, and Assistant Trade Commissioner, H.B.Howard, during Christmas vacation period. Information was furnished by a representative of the Ministry of Economics.