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Synthesis of Local Catalysts and There Application for Catalytic Conversion

N. Bentahar*

Department of the Chemical and Pharmaceutical Processes, M'hamed Bougara University, Algeria

Introduction

Solid catalysts for petroleum refining and catalytic transformations have been developed starting from local Algerian materials, mainly "bentonite". These catalysts are used for the transformation of the heavy fractions and the residues of the oil by the catalytic processes leading to obtaining clean and environmentally friendly petrol (fuel) as well as petroleum fractions that are considered as important raw materials for petrochemical, pharmaceutical, and cosmetic industry. The preparation of modified catalysts using Algerian local bentonite enriched by oxides to give them a better performance for the validation of certain fractions of oil and condensate is described.

Heterogeneous catalysis has considerably influenced the refining and petrochemical industries. The 30s of the 20th century have seen the development of three main types of processes, which were intended for primary refining, namely the catalytic cracking, alkylation and dehydrogenation. This is also valid for other important industrial process named the Fischer-Tropsch process using Co / Fe catalysts which converts coal into synthetic gas that is processed into cuts C5-C11-rich olefins and paraffins. This method is widely used in Japan, Germany and South Africa.

Nowadays heterogeneous catalysis dominates and determines the great advances in refining and petrochemical industries. It is noted that the sales of catalysts for refineries reached $ 2.7 billions in 2005 with an annual increase of 3.24% and still in progress. Taken together, the industrial catalysts are the heart of the refining processes and they determine their future. The catalytic processes are increasingly developing and the discovery of new catalysts still represents urgent need.

Heterogeneous catalysis or contact catalysis is to achieve a transformation of liquid or gaseous reagents by using a solid catalyst; the chemical process takes place at solid-fluid interface by adsorption of reagents at specific sites of the solid surface, which are capable of contracting with reactive chemical bonds more or less strong. The adsorbed species are better and strongly formed if the catalyst is properly selected for the desired reaction according to the Sabatier principle. Therefore the introduction of surface atoms or ions plays an important role. In the present work, the preparation of modified catalysts using Algerian local bentonite enriched by oxides to give them a better performance for the validation of certain fractions of oil and condensate is described.

The catalysts prepared from local materials allowed us to conduct experiments on various charges compounding consisting of atmospheric residue and heavy diesel in the case of cracking and light fractions of condensate in the case of isomerization.

The culmination of the work is the development of local bentonite by its application in industrial processes for obtaining oil from waste and light fractions of condensate, bases clean gasoline with high octane.

In addition, the resulting gasoline is highly aromatic and can be used in the production of BTX necessary for the petrochemical industry. In addition to the catalytic cracking process produces large quantities of gases consisting mainly of unsaturated fractions BTAN-butylene-propylene and propane is also much sought after for the manufacture of high octane gasoline.

It should be noted that to improve the desired product yields it is necessary that to recycle the residuals. The gas oil obtained is possibly consistent with commercial specifications and can overcome the deficits in this product during peak periods.

The convincing results encourage us to reproduce the work in laboratory scale units before translating it to an industrial scale. In future research we recommend the use of catalysts of different compositions: for example the introduction of nickel compounds; whose properties are equivalent to the isomerizing ability of chromium.

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***Address for Correspondence:** Bentahar N, Department of the Chemical and Pharmaceutical Processes, M'hamed Bougara University, Algeria, Email: dentaharnoor@hotmail.com*

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