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Palladium Catalysts on Carbon Supports Prepared from a Natural Graphite and Anthracite

Boris N. Kuznetsov, Nikolai V. Chesnokov*[a], Nadezhda M. Mikova[b] and Tatyana G. Shendrik[c]

[a] Siberian Federal University, 79 Svobodny, Krasnoyarsk, 660041, Russia

[b] Institute of Chemistry and Chemical Technology SB RAS, 42 K.Marx st., Krasnoyarsk, 660049, Russia

[c] Institute of Physical-Organic and Coal Chemistry NAS, 70 R. Luxemburg st., Donetsk, 340114, Ukraine [1]

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Influence of the conditions of the carbon supports preparation from an expanded natural graphite and chemically modified anthracites on the formation of carbon porous structure, on the distribution and sizes of supported palladium particles and their catalytic activity in liquid phase reactions of hexene-1 and cyclohexene hydrogenation has been studied. At the same reaction parameters and Pd content the catalytic activity of different samples varies by more than 100 times. Besides, the activity of some catalysts in hexene hydrogenation is much higher (up to 20 times) than that in cyclohexene hydrogenation reaction. The possible reasons for observed differences in Pd catalyst behavior are analysed.

Keywords: palladium catalyst, carbon support, expanded graphite, anthracites, chemical modification, hexene and cyclohexene hydrogenation.

Introduction

Rather high cost of synthetic active carbons can restrict the scale of carbon supports application in the industrial catalysis. At the same time the significant resources of inexpensive raw materials, presented by natural graphites and anthracite are not sufficiently used for the catalyst supports manufacture.

Relatively low reaction ability of natural graphites towards the activation agents (steam, oxygen, carbon dioxide) can make problems in the preparation of porous carbon supports on their basis. But graphites are able to form graphite intercalated compounds which can sufficiently (by hundreds times) increase their volume after a high temperature treatment [1]. This unique property of intercalated graphites was used for manufacturing thermally expanded graphites. The latter have found an application in the production of various non-porous carbon products. The expanded graphites also have good prospects for their use in the preparation of carbon sorbents [2, 3] and catalyst supports [4-7]. At present a wide variety of graphite intercalated compounds is known and different methods are used for their synthesis. These conditions are favorable for

* Corresponding author E-mail address: cnv@icct.ru

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