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Application of a hydrogenolysis catalyst for the synthesis of high-technology products for civilian industry

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Abstract

The technology of obtaining and processing a Pd/S type hydrogenolysis catalyst (palladium on sibunite) was developed and put into production at "FR&PC "Altai" enterprise. For the synthesis of a high-energy oxidizer 2,4,6,8,10,12-hexanitro 2,4,6,8,10,12-hexaazaisowurtzitane (CL-20) that is a new and the most powerful military product to date. The brand of hydrogenolysis catalyst is a very labor-intensive and high-tech semi-finished product participating in the key synthetic stages of CL-20 production – catalytic hydrogenolysis, including debenzilation and subsequent acylation of 2,4,6,8,10,12-hexabenzyl 2,4,6,8,10,12-hexaazaiso-wurtzitane (GB).

As part of the diversification of high-tech products production for civilian industry, various applications of the catalyst produced by "FR&PC "Altai" in various organic synthesis reactions which are described in the article were studied.

The hydrogenolysis catalyst produced by "FR&PC "Altai" was successfully tested in the preparative synthesis of various pharmacological substances such as analgesics, precursors, adrenomimetics, biologically active substances (thiowurcin, mezaton and its derivatives – epinephrine and norepinephrine, dihydroco-deinone, dihydrobetulinic acid; derivatives of aminocaproic acid and diaminofluorenone). Good results were also shown on the use of a hydrogenolysis catalyst that was produced by SC "FR&PC "Altai" in the synthesis of technical chemistry products and dual-use organic substrates, such as the triatomic aromatic alcohol phloroglucin and the frame polycyclic amine 2,6,8,12-tetraacetyl 2,4,6,8,10,12-hexaazaisowurtzitane (TADA). Thus, the possibility of using a catalyst produced by SC "FR&PC "Altai" in the processes of hydrogenation and hydrogenolysis of functionally different organic compounds has been demonstrated. It gives great opportunities to diversify the manufacture of high-tech dual-use and civilian products by SC "FR&PC "Altai".

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