

Polyorganosilazanes: production, properties, application

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Content

Introduction

1. Chemical synthesis of polysilazanes

2. The use of polysilazanes

3. Compositions of polysilazanes

Consequence

Abstract

A review is given on the class of organosilicon compounds – polysilazanes. The review includes the history of the discovery of silazanes, the main chemical methods for producing silazanes, the main reactions taking place with the participation of silazanes, and the scope of application of silazanes. The review shows the composition of silazanes. The review consists of 40 literature sources.

The synthesis of polyorganosilazanes was first described in 1964 by Kruger and Rohov. In the interaction of ammonia with chlorosilanes (ammonolysis), trimeric or tetrameric cyclosilazanes were formed at the beginning and in the subsequent reaction at high temperatures with a catalyst to obtain polymers with a higher molecular weight. Ammonolysis of chlorosilanes is still the most important synthetic route to polysilazanes. The industrial production of chlorosilanes using the Muller-Roch process, first reported in 1940, served as the cornerstone for the development of silazane chemistry. In the 1960s, the first attempts to turn organosilicon polymers into quasi-ceramic materials were described. At this time, suitable (“pre-ceramic”) polymers are heated to 1000 °C. or higher. It was shown that the elimination of organic groups and hydrogen leads to a rearrangement of the molecular network with the formation of amorphous inorganic materials, which show unique chemical and physical properties. Using polymer-derived ceramics, new applications can be discovered, especially in the field of high-strength materials.

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