

## Polysilazaoxanes and adhesive compositions based on them

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### Abstract

The polymer formation proceeding with the participation of cardosilazaoxane organosilicon oligomers are considered. By the interaction of cardocyclic silazaoxanes with organosiloxane diols, new types of organosilicon oligomers are synthesized. They are capable to form elastic spatial-netted structures due to polymerization processes with the discovery of cyclic siloxane fragments without isolation of low molecular weight by-products. The influence of temperature and the silazaoxane: diol ratio on the nature of the products formed is studied. It was established that at 120-130 °C soluble oligomers of cycloliner structure are formed, which are structured at 180-190 °C, with the most dense network structure being formed when the silazoxane: diol ratio is close to equimolar; a certain excess of hydroxyl groups at the final stage of polymerization leads to the association of the released ammonia with OH end groups and the formation of nucleophilic particles at the ends of the polymer chains – siloxanolate anions, possibly initiating structuring.

The formation of regular three-dimensional structures – polysilazaoxanes, initiated by siloxanolate anions without the use of a special catalyst, is a new approach to the creation of adhesive compositions. In this case, in contrast to catalytically cured siloxane analogues, the resulting cross-linked polymer structures exhibit enhanced adhesion to the substrate material. Such polysilazaoxane oligomers can be used: a) as a basis for adhesives, only thermal effects and compounds containing siloxane films and coatings with various metals and characteristics can be used as a catalyst; b) for hydrophobic impregnation of textile materials and leather half-finished products, since this is clearly ammonia, which does not have a destructive effect on them.

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