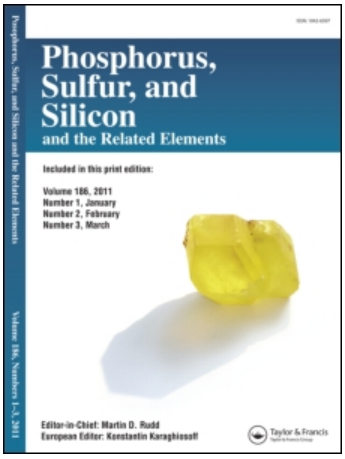

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THE MECHANISM OF INTERACTION OF SULPHUR AND p-PHENYLENEDIAMINE

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THE MECHANISM OF INTERACTION OF SULPHUR AND p-PHENYLENEDIAMINE

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Several studies which have been undertaken on reaction of sulphur and p-phenylenediamine give controversial proposals of mechanisms. Many authors postulate an attack of sulphur diradicals directed onto amino group.

In this work we present results of our research on reaction of sulphur and p-phenylenediamine in various mediums.

In the reaction of sulphur and p-phenylenediamine in tetralin besides polyamine sequences, the -NH-S- bonds are also formed :

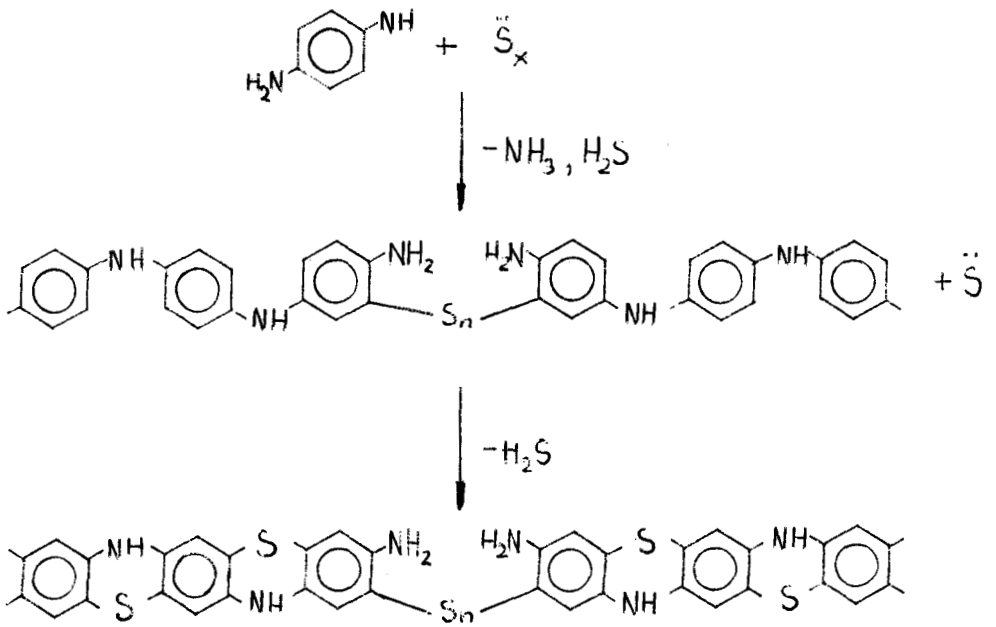
$$NH_2C_6H_4NH_2 + S_8 \longrightarrow NH_2C_6H_4\overset{+}{N}H_2\text{-}S\text{-}S_6\text{-}S^- \longrightarrow NH_2C_6H_4\overset{+}{N}H_2S_x^{\cdot} + \dot{S}_y^-$$

$$2\ NH_2C_6H_4NH_2S_x^{\cdot} \xrightarrow[-\ 2H]{} NH_2C_6H_4NHS_xS_xNHC_6H_4NH_2 + S_8 \longrightarrow \text{etc.}$$

From the mechanism given above it issues that in reaction carried out in tetralin, sulphur attacks a nitrogen atom.

In the case of the reaction of sulphur and p-phenylenediamine in 1-methyl-2-pyrrolidone a forming of different products was observed. It indicates the other route of reaction.

It was established that during the heating of p-phenylenediamine to the temperature of 200°C the elimination of ammonia occures and polyamines are formed. Evolution of hydrogen sulphide was also observed which is a result of an attack of sulphur diradicals onto benzene ring. The main products are polymeric sulphides of polyamines which tend to cyclisation accompanied by forming of thiazine rings :



The obtained products we identificated by means of elemental analysis,chemical methods and IR,NMR,UV spectroscopy.