

Nanocomposites and nanomaterials

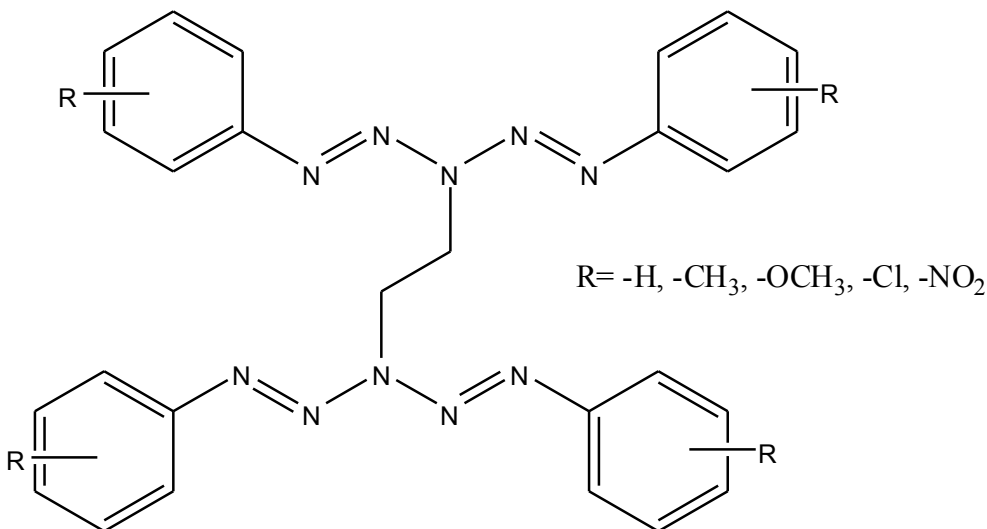
Novel crosslinkers for nanomaterials based on bis-pentazadienes

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Pentazadienes are new class of organic compounds able to form free-radicals during UV-light irradiation or heating [1]. Due to this fact these compounds can be used in free-radical polymerization processes. Activities of pentazadiene group in photolysis reaction and formed free-radicals depend on substituents [2]. Only 1,5-aryl-3-alkyl pentazadienes are stable in normal conditions. Hence, variation of substituents from electron-donor to electron-acceptor provides a possibility to generate radicals with different activity. Bis-pentazadienes in general are more photoactive than mono-pentazadienes.



Synthesis of these compounds is based on [diazotization](#) of aromatic amines in acid medium and further interaction of obtained diazonium salts with aliphatic diamines. Series of bis-pentazadienes with different photoactivity obtained and structures of products were proved by ¹H-NMR, IR, UV/Vis and mass spectroscopies.

Photolysis reaction of bis-pentazadienes can lead to biradicals formation and this fact provides the possibility to use them as effective photoinitiators and photocrosslinkers for polymer nanocomposites. Further experiments in this field are in progress.

1. *Baindl A., Lang A., Nuyken O.* High and low molar mass 3-alkyl-1,4-pentazadienes. Synthesis and photolysis // *Macromol. Chem. Phys.*-1996.-**197**.-P.4155-4171
2. *Yeshchenko N., Syromyatnikov V.* Pentazadienes as new photoinitiators in development of new materials // *Mol. Cryst. Liq. Cryst.*,-2005.-**427**-P. 169-179.