MECHANISM OF DECOMPOSITION OF SUBSTITUTED (DINITROPYRAZOLYL)AZOXYFURAZANS

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Abstract: The thermal decomposition of substituted (dinitropyrazolyl) azoxyfurazans was studied under nonisothermal and isothermal conditions. It turned out that the thermal decomposition of some azoxy compounds in open systems can occur without significant heat release. Possible pathways of decomposition of the studied compounds are considered. In all cases they begin with the cleavage of the bond between the azoxy group and the furazan ring. The insignificant heat effect of the initial stage of decomposition of azoxy compounds makes it difficult to determine the actual kinetic parameters by differential scanning calorimetry (DSC).

Keywords: thermal decomposition; decomposition kinetics; azoxy compounds; (dinitropyrazolyl)azoxyfurazanes

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Figure Captions

Figure 1 Structural formulae of the investigated substances

Figure 2 Gas release curves for isothermal decomposition of compounds **1**–**3**: *1* — **1**, 220 °C; *2* — **2**, 220 °C; and *3* — **3**, 200 °C

Figure 3 Comparison of kinetic parameters of decomposition of compound **1** under nonisothermal conditions (DSC) in closed crucibles (empty signs) and crucibles with a hole (filled signs) with decomposition data under isothermal conditions of iso-TGA ($k_{\text{iso-TGA}}$) and manometry (k_{MM})

Figure 4 Comparison of kinetic parameters of decomposition of compound **2** under nonisothermal conditions (DSC) in closed crucibles ($k_{\text{N}_2\text{O}}$) and in crucibles with a hole (triangles, peaks 1 and 2) with decomposition data under isothermal conditions (k_1 and k_2)

Figure 5 Comparison of kinetic parameters of decomposition of compound **3** under nonisothermal conditions (DSC) in closed crucibles ($k_{\text{N}_2\text{O}}$) and in crucibles with a hole (triangles, peaks 1 and 2) with data of decomposition under isothermal conditions by iso-TGA ($k_{\text{iso-TGA}}$) and manometry (k_1 and k_2)

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