Thermochemical Studies on N-Thenoylthiocarbamic-O-N-Alkyl Esters

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The aim of this work is to study the energetics of N-thenoylthiocarbamic-O-n-alkyl esters, as depicted below, focused on the study of the influence of the size of the alkyl chain in the ester group.

N-thenoylthiocarbamic-O-n-alkyl esters
$C_5H_4S(CO)(NH)(CS)$-O-R
$R = -(CH_2)_nCH_3$; n = 1 to 5

The standard molar enthalpies of combustion and sublimation of five N-thenoylthiocarbamic-O- n-alkyl esters were measured at T=298.15 K by rotating bomb calorimetry and by high temperature Calvet microcalorimetry, respectively, and the standard molar enthalpies of formation in the gaseous state was derived. Differential scanning calorimetry (dsc) was used in order to measure the temperatures and enthalpies of fusion for all the compounds.

The experimental results obtained in this series of homologous N-thenoylthiocarbamic-O-n-alkyl esters reveal an odd-even effect in the stability of their crystalline phase. The gas-phase energetics will be discussed in terms of the respective methylen-group contributions.

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