

# Phase Polymorphism of $[\text{Mn}(\text{DMSO})_6](\text{BF}_4)_2$ Studied by Differential Scanning Calorimetry

Anna Migdał-Mikuli and Łukasz Skoczylas

Department of Chemical Physics, Faculty of Chemistry, Jagiellonian University, Ingardena 3,  
30-060 Kraków, Poland

Reprint requests to A. M.-M.; Fax: +48 12 634 0515; E-mail: migdalmi@chemia.uj.edu.pl

Z. Naturforsch. **63a**, 808 – 812 (2008); received May 13, 2008

The tetrafluoroborate of hexadimethylsulfoxidemanganese(II) was synthesized and studied by differential scanning calorimetry. Five solid phases of  $[\text{Mn}(\text{DMSO})_6](\text{BF}_4)_2$  were revealed. Specifically, four phase transitions of the first order were detected between the following solid phases: stable KIb  $\leftrightarrow$  stable KIa at  $T_{\text{C}4} = 215$  K; metastable KIII  $\leftrightarrow$  overcooled K0 at  $T_{\text{C}3} = 354$  K; metastable KII  $\leftrightarrow$  overcooled K0 at  $T_{\text{C}2} = 377$  K; stable KIa  $\rightarrow$  stable K0 at  $T_{\text{C}1} = 385$  K.  $[\text{Mn}(\text{DMSO})_6](\text{BF}_4)_2$  starts to decompose at 400 K with a loss of one DMSO molecule per formula unit and forms  $[\text{Mn}(\text{DMSO})_5](\text{BF}_4)_2$  which next decomposes in one step to  $\text{MnF}_2$  at the temperature range of 460 – 583 K. From the entropy changes it can be concluded that the phases K0 and metastable KII are orientationally dynamically disordered (ODDIC) crystals. The stable phases KIb and KIa are ordered solid phases.

*Key words:* Hexadimethylsulfoxidemanganese(II) Tetrafluoroborate; Phase Transitions; DSC.