Phase Polymorphism of $[Co(DMSO)_6](BF_4)_2$ Studied by Differential Scanning Calorimetry

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Five solid phases of $[Co(DMSO)_6](BF_4)_2$ have been detected by differential scanning calorimetry (DSC). Phase transitions were detected between the following solid phases: stable KIb ↔ stable KIa at $\overline{T}_{C4} = (328 \pm 2)$ K, metastable KIII ↔ undercooled phase K0 at $\overline{T}_{C3} = (383 \pm 4)$ K, metastable KII ↔ undercooled K0 at $\overline{T}_{C2} = (399 \pm 2)$ K and stable KIa ↔ stable K0 at $\overline{T}_{C1} = (404 \pm 1)$ K. The title compound melts at $T_m = 440$ K. From the entropy changes at the melting point and at phase transitions it can be concluded that the phases K0 and undercooled K0 are orientationally dynamically disordered crystals. The stable phases KIa, KIb are ordered solid phases. The metastable phases KII and KIII are probably solid phases with a high degree of orientational dynamical disorder.

Key words: Hexadimethylsulphoxidecobalt(II) Tetrafluoroborate; Phase Transitions; Melting Point; DSC.