THE $(CF_3S)_2N\cdot$ radical : PREPARATION, DIMERIZATION, ESR-STUDIES

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The Bis (trifluormethylmercapto) amino radical $(CF_3S)_2N\cdot$ has been prepared by oxidation of Bis (trifluormethylmercapto) amine, $(CF_3S)_2NH$ with activated lead dioxide in CCl_3F solution at room temperature.

The 10^{-5} - 10^{-6} molar solution of the radical shows in the ESR-spectrum a triplett of septetts with a isotropic nitrogen hyperfine splitting constant $a(^{14}N)$ = 13,2 G, $a(^{19}F)$ = 1.95 G, indicating that the radical is a planar sp^2 species where the unpaired electron is located predominantly in the nitrogen 2p orbital.

It is suggested that in solution an thermal equilibrium exists between the $(CF_3S)_2$ N radical and its dimer Tetrakis (trifluormethylmercapto)-hydrazine:

$$2\ (CF_3S)_2N\cdot \rightleftharpoons (CF_3S)_2\ N\text{-}N\ (SCF_3)_2$$

Aspects of preparation as well as thermodynamic and kinetic details of the hydrazine (N-N bond strength 7 $kcal/mol^{-1}$) and the equilibrium, which can be followed by ESR-spectroscopy will be given.