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ALKYLIDENE SULFUR TETRAFLUORIDES AND ALKYLTETRAFLUOROSULFURANONIUM IONS

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The preparation of $H_2C=SF_4$, $CH_3-CH=SF_4$, $CF_3-CH=SF_4$, $CF_3(CH_3)C=SF_4$ and other alkylidene sulfur tetrafluorides is presented.

The structure of these materials are all alike: trigonal bipyramidal coordination of sulfur, the double bonded carbon occupying an equatorial position, and the carbon substituents (H, CH_3, CF_3) being fixed in the axial plane. Furthermore, all such compounds turn out to be rigid. The CS bond is regarded as a true double bond. Reactions of these compounds are either the cleavage into SF_4 and the carbene RR'C, or simple cis-addition across the double bond.

The alkyl-tetrafluoro-sulfuranonium ions are only transient species, and are detected with ^1H and ^{19}F nmr spectroscopy at low temperatures. They are formed by fluoride ion abstraction from $R-SF_5$ compounds. Their ease of formation and stability are discussed as a function of R, the solvent, and the fluoride ion abstractor.