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PFC'S BIOLOGICAL CARRIERS OF GASES: SYNTHESIS OF F-ALKYLATED SULFIDES AND RELATED COMPOUNDS

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New compounds ($R_FC_2H_4S-C_2H_4R'_F$ with $R_F=R'_F$ ou $R_F\neq R'_F$),corresponding sulfoxides and sulfones,and related compounds,were prepared,purified and characterized to investigate further the relalionship between chemical structure and their usefulness as components of artificial blood.
The Sulfides are chemically inert;only oxidations leading to sulfoxides and sulfones under very hard conditions (concentrated H_2O_2,heating)were performed.
The oxygen carrier capability was leasured by two ways:-Determination of magnetic susceptibility by NMR using two different configuration spectrometers. - Gas chromatography.
Results of the two methods are in good agreement and the same as the best products used as artificial blood substitutes : O_2(40% vol.,NMR and G.C.), N_2(35% vol.,G.C.),CO_2(150ml/100ml G.C.).Other avantages of such products : -Synthesis quite simple,specific univocal chemical routes. -Series of homologous compounds to permit optimisation of vapor pressure and viscosity on which depends the most important parameters of emulsions -Starting materials commercially avalaible; -Quite quantitative yields. News series of related compounds were obtained,modifying basic structure in the former step of the synthesis by chemical routes.

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A NEW SYNTHETIC APPROACH TO PERFLUOROCHEMICALS: PHOTOFLUORINATION WITH 100% FLUORINE IN SOLUTION

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Preparative liquid-phase direct perfluorination of organic compounds with elemental fluorine has not previously been developed, presumably owing to the occasional violence of the reaction and its tendency to give oligomers. We have devised a safe, effective technique based on controlled inverse addition of the organic substrate to a well-stirred saturated (about 0.02 M) solution of elemental fluorine in an unreactive solvent, accompanied by UV-irradiation. All work to date has been conducted in reactors constructed of Teflon, brass, copper and nickel, using F-hexane as the solvent, at a temperature of typically -5 to -20°C. 100% fluorine at atmospheric pressure is continuously supplied to maintain saturation; illumination is by a medium-pressure Hg arc in a sapphire immersion well. The substrates to be fluorinated are, in most cases, partly fluorinated amines and ethers derived from commercially-available F-olefins. Perfluorinated products are obtained without the accompanying isomerization usual in the electrochemical (ECF) process, in good yields and at fluorination rates also comparable to those reported in ECF reactors of similar volume. Typical results will be presented, along with supporting spectral data and physical properties.