

THE SOLUBILITY OF CARBOXYLIC ACIDS, AMINO AND FATTY ACIDS AND OSES, IN A HOMOGENEOUS SERIES OF PERFLUORO-CHEMICALS

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Aside from the case of permanent gases, little is known about the solubility of chemicals and biologically relevant organic molecules in perfluorochemicals (PFC). Such knowledge is desirable in connection with the possible interaction of biomolecules with PFC-emulsions as used in blood substitutes, with the transport of metabolites, with the conveying of drugs to specific organs or to tumors, with the control of cell cultures, etc.. VPC was used to evaluate the capacity of a series of structurally related PFCs to dissolve over 50 compounds, including organic acids, amino and fatty acids, and oses, at 37° C. Contrary to what had been observed for O₂, the position of the double bond or its being saturated with F₂ or H₂ had not much effect on their capacity to dissolve organic acids; nor had their being degassed or not, or saturated with O₂ or with CO₂. The nature of R in RCOOH was, on the contrary, of considerable importance. Interesting co-dissolution effects were observed : e.g. the addition of one equivalent of the PFC-miscible CF₃COOH to the PFC-insoluble HCOOH renders the mixture miscible with PFCs, indicating the formation of hydrogen-bound dimers. Critical solubility temperatures of PFCs in hexane, which have been suggested to reflect relative lipid solubility, were also determined.

STANDARD PURIFICATION AND DETOXIFICATION PROCEDURES FOR BIS(F-ALKYL)ETHENES TO BE USED IN MEDICINE AND BIOLOGY. USE OF NAMALVA LYMPHOID CELL CULTURES AS A TOXICITY TEST

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The need for reproducible, efficient but economic and industrially feasible, standard protocols for purifying and detoxifying perfluorochemicals for biomedical applications (artificial blood substitutes, culture of microorganisms, etc.) has been stressed repeatedly¹. The absence of toxicity is an obvious but often hard-to-meet prerequisite for such applications. We have evaluated a variety of single purification operations and a range of successive purification steps, on a series of bis(F-alkyl)ethenes. A similar approach was made to purifying other relevant emulsion components, i.e. surfactants, oncotic agents and water. The efficacy of each individual step was tested by controlling the effect of the purified material on the viability, morphology and multiplication rate of lymphoid cells of the Namalva strain.

R.P. GEYER, Proceed. IVth International Symposium on Perfluorochemical Blood Substitutes, Kyoto, 1978; Excerpta Medica, Amsterdam, 1979, p. 3; J.G. RIESS and M. LE BLANC, Angew. Chem. Int. Ed. 17, 621 (1978).