

THE PECULIARITY OF THE STRUCTURE AND REACTIVITY OF THE
 HFP TRIMERS

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The X-ray structural study of a number of the HFP dimers and trimers derivatives allowed to calculate the strain energy and valent angles distortion (Δ°) by MM2 method for saturated and unsaturated derivatives of the F-olefins.

F-olefins	Strain energy (kcal/mol) of the reactions products*		ΔV kcal/mol	$\Delta^{\circ}=3 \cdot 109.7 - \sum \omega$
	substitution	addition		
Hexafluoropropene (HFP)	16.7	20.5	3.8	7.1
Octafluoroisobutene	21.5	26.2	4.7	10.8
Dimer HFP	47.6	53.3	5.7	11.8
Trimer HFP	75.4	[88.4]	13.0	21.4

* in the reactions with methanol

These data explain the absence of addition products in the reaction of the HFP trimers with nucleophiles. The energy of the sterical strain in saturated molecules with sp^3 -hybridization of the central C-atom is always greater than in the unsaturated ones with sp^2 C-atoms. The greatest ΔV value jump takes place by passing to trimer's derivatives. In this case the distortion angle defining the planarity of the structure is maximal too. Obviously, these addition products have a maximal sterical C-H acidity in these series, that's why they can't exist in the reaction conditions. The stabilities of tert-perfluorocarbanions are in the same good agreement with the calculation data obtained.