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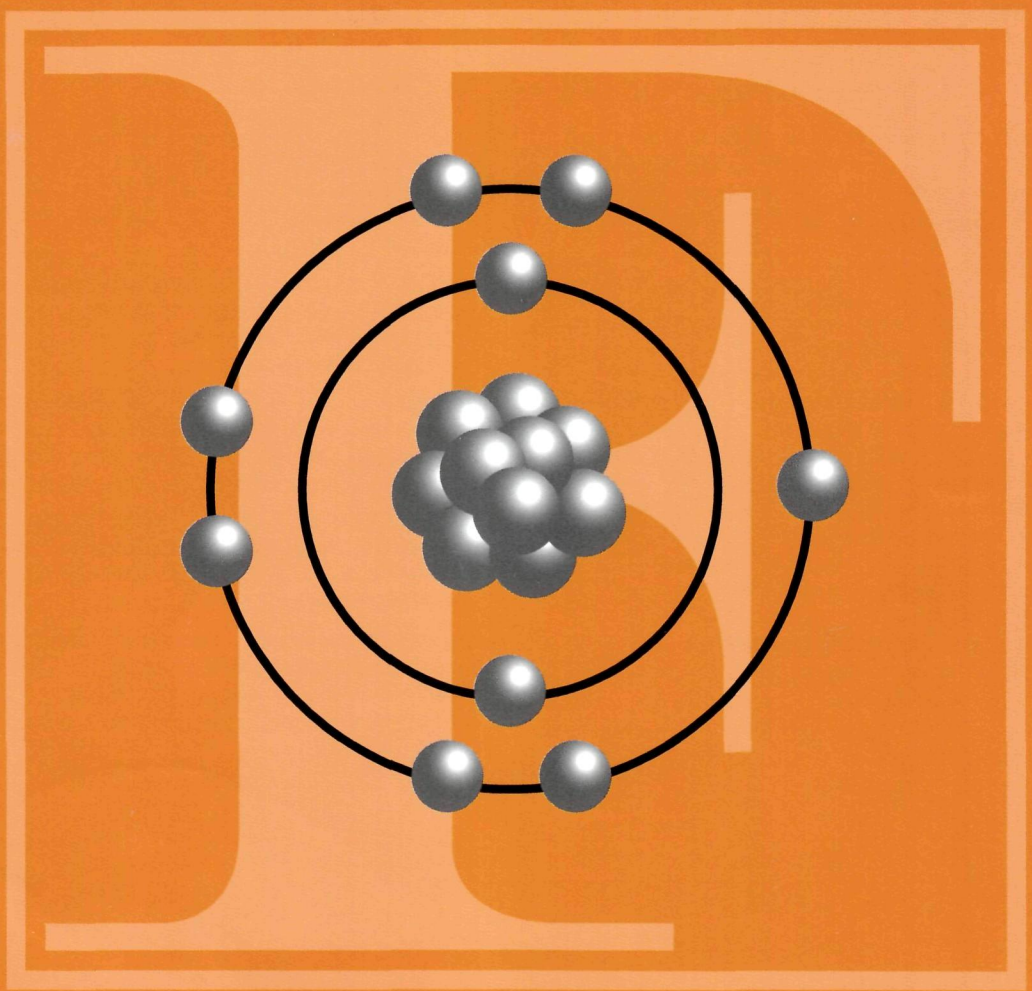

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Control of hydroxyl group conformation by the pentafluorosulfanyl group

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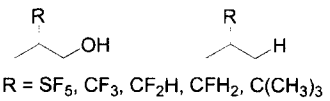

► The effects of fluorinated groups (SF_5, CF_3, CF_2H and CFH_2) were compared. ► The SF_5-substitution leads to large barrier to rotation about the SF_5C–COH bond. ► RC–CO and C–S virtual orbitals influence the hydroxyl group conformation.

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Aluminum and lanthanum effects in natural materials on the adsorption of fluoride ions

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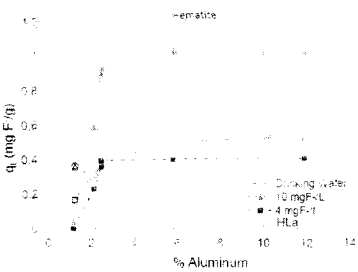

► An electrochemical method was applied to modified natural materials with aluminum. ► Aluminum modified hematite is more efficient for fluoride than the modified zeolite. ► Adsorption capacities depend on the content of aluminum in the samples. ► Aluminum modified materials are more efficient for fluoride than lanthanum ones. ► Modified aluminum hematite and zeolite are useful to remove fluoride from water.

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Cycloaddition of N-substituted imines of trifluoropyruvate with diazomethane: Efficient synthesis of 2-(trifluoromethyl)aziridine-2-carboxylates

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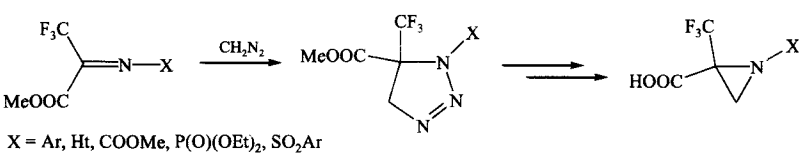
► An effective synthesis for 2-trifluorometylaziridine-2-carboxylates is developed. ► The method is based on reaction of trifluoropyruvate imines with diazomethane. ► Reaction of trifluoropyruvate imines with diazomethane leads to triazolines 3. ► Triazolines 3 upon heating or acid catalysis give respective aziridinecarboxylates 4.



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The enantioselective trifluoromethylation of aromatic aldehydes by quaternary ammonium bromide and (IPr)CuF at low catalyst loading

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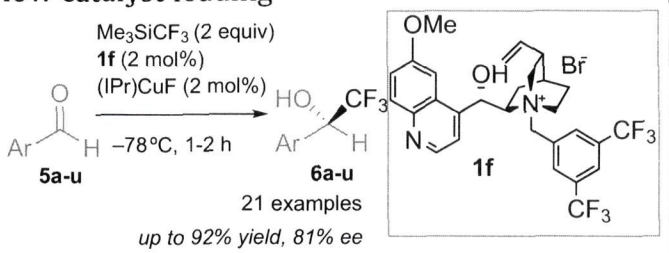

► A cooperative catalyst for enantioselective trifluoromethylation has been developed. ► The hydroxy at C-9 has a significant influence on enantioselectivity. ► The reaction requires only 2 mol% of catalyst loading. ► The plausible catalytic cycle has been proposed. ► The initiation of Me_3SiCF_3 by (IPr)CuF is the key factor for the high performance.

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Study of addition of difluorocarbene on double bond of triterpenes

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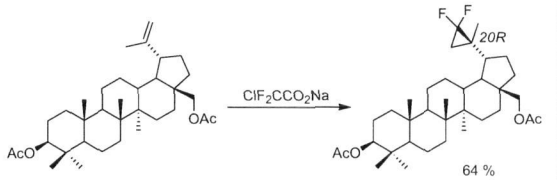

► We synthesized a group of novel difluorocyclopropyl derivatives from natural and semisynthetic triterpenes by adition of difluorocarbenes (generated *in situ* by heating of sodium chlorodifluoroacetate in diglyme) on C=C double bond. ► Only activated double bonds underwent the reactions with difluorocarbene. ► We confirmed the structures of our new difluorocyclopropyl derivatives. ► The configuration on new chiral centers was determined by 2D-NMR techniques and molecular modeling.

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Facile and efficient preparation of high-performance $REBa_2Cu_3O_{7-x}$ superconducting films through a novel fluorinated solution route

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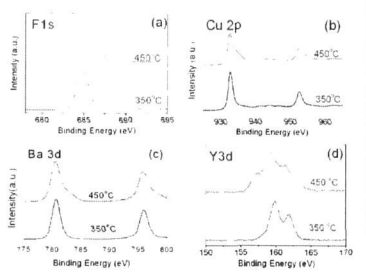

► An advanced low-fluorine solution was used to prepare REBCO films. ► High-efficiency fabrication of high-performance REBCO films was realized. ► Fluorides and oxides were formed as intermediate phase in the precursor films. ► Formation and removal mechanism of fluorides were discussed.

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Synthesis of 1-aroyl(1-arylsulfonyl)-4-*bis*(trifluoromethyl)alkyl semicarbazides as potential physiologically active compounds

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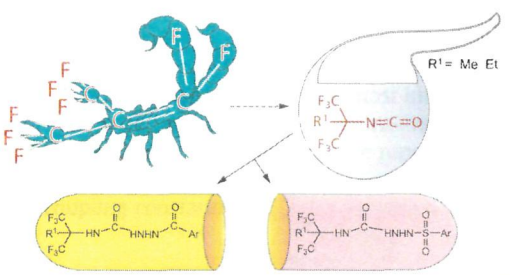

► 1,1-*Bis*(trifluoromethyl)alkyl isocyanates obtained from PFIB react with hydrazides. ► 28 prospective bioactive polyfluorinated 1,4-substituted semicarbazides were synthesized. ► The Lipinski's and Gelovani's parameters were calculated. ► 2 Adjustments to the Lipinski rules are suggested for fluorinated drug candidates.

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The synthesis of fluorinated endcaps: Part 1. The effect of C-7 fluorination on the base-catalyzed monohydrolysis of 5-norbornenyl-2,3-diesters

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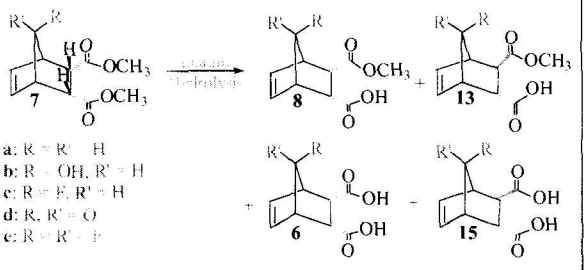
Ethel and David Resnick Chair in Active Oxygen Chemistry, Bar-Ilan University, Ramat Gan 52900, Israel

► Fluorination of norbornene endcaps should improve thermal stability of polyimides. ► Require facile approach to 7-fluoro and 7,7-difluoro-5-norbornenyl-2,3-acidesters. ► Saponification of 5-norbornenyl-2,3-diesters yields various products. ► Products include mono- and dihydrolysis and configuration inversion. ► Electronic factors from C-7 substituent determine yield and distribution.



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The synthesis of fluorinated endcaps: Part 2. Preserving the *endo,endo* configuration in the monohydrolysis of 7-fluorinated nadic diesters

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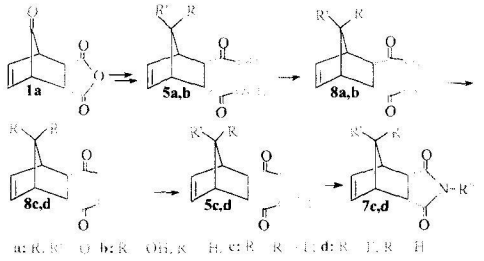
► Fluorination of norbornene endcaps should improve thermal stability of polyimides. ► Require facile approach to 7-fluoro and 7,7-difluoro-5-norbornenyl-2,3-acidesters. ► Differentiation between the two carboxyls must precede fluorination. ► Mixed *t*-butyl methyl diesters were prepared without configuration loss. ► Selective *t*-butyl ester hydrolysis is mediated by formic acid.



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Defluoridation from aqueous solution by manganese oxide coated graphene oxide

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► A new adsorbent manganese oxide coated graphene oxide was prepared. ► The maximum fluoride adsorption capacity of MOGO was 11.93 mg/g and 8.34 times higher than that of GO. ► Fluoride adsorption by MOGO was spontaneous and endothermic in nature. ► The optimum solution pH for fluoride removal was at ranges of 3.8–7.5.