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Synthesis of fluorofurans and perfluoroalkylfurans

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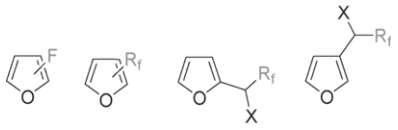
[c]North-Ossetian State University, Department of Organic and Physical Chemistry, Vatutina 46, Vladikavkaz 362025, Russian Federation

The present review covers the main schemes of syntheses of fluorofurans and perfluoroalkylfurans which contain a perfluoroalkyl group in the heterocycle and in the α-position of the carbon chain of substituents in the furan ring.



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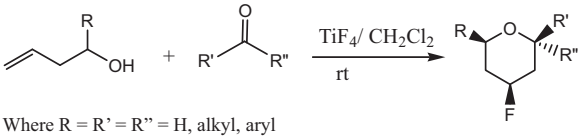
Titanium tetrafluoride: An efficient Lewis acid and fluorinating agent for stereoselective synthesis of 4-fluorotetrahydropyran

S. Bondalapati, U.C. Reddy, D.S. Kundu, Anil K. Saikia

Department of Chemistry, Indian Institute of Technology Guwahati, Guwahati 781039, Assam, India

Titanium tetrafluoride can efficiently be used for strereoselective synthesis of 4-fluorotetrahydropyran via Prins cyclization in good yield. The method is general and can be used for aldehydes as well as ketones.



Where R = R' = R" = H, alkyl, aryl

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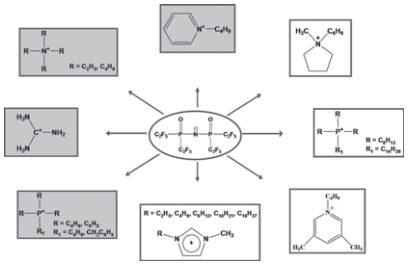
New ionic liquids with the bis[bis(pentafluoroethyl)phosphinyl]imide anion, $[(C_2F_5)_2P(O)]_2N^-$—Synthesis and characterization

Dana Bejan[a], Nikolai Ignat'ev[b], Helge Willner[a]

[a]Bergische Universität Wuppertal, FB C – Anorganische Chemie, Gaußstr. 20, D-42097 Wuppertal, Germany
[b]Merck KGaA, Frankfurter Str. 250, D-64293 Darmstadt, Germany

Ionic liquids with the bis[bis(pentafluoroethyl)phosphinyl]imide – anion are synthesized via metathesis reactions in aqueous solution.



doi:10.1016/S0022-1139(10)00034-5

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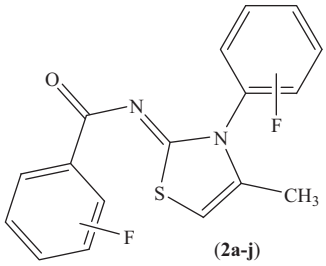
Synthesis and antimicrobial activity of some novel 2-(substituted fluorobenzoylimino)-3-(substituted fluorophenyl)-4-methyl-1, 3-thiazolines

Aamer Saeed[a], Uzma Shaheen[a], Abdul Hameed[b], Faiza Kazmi[b]

[a]*Department of Chemistry, Quaid-I-Azam University, Islamabad 45320, Pakistan*
[b]*Department of Microbiology, Quaid-I-Azam University, Islamabad 45320, Pakistan*

Novel 2-, 3-, and 4-fluorosubstituted 2-(benzoylimino)-3-aryl-4-methyl-1,3-thiazolines (**2a–j**) were synthesized by the base-catalyzed cyclization of corresponding 1-(fluorobenzoyl)-3-(fluorophenyl)thioureas with 2-bromoacetone in water. All of the compounds showed good to significant *in vitro* antimicrobial activity.



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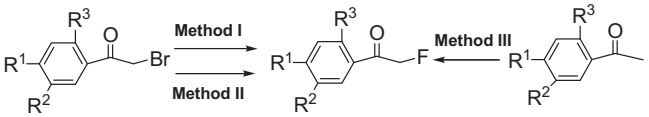
One-pot α-nucleophilic fluorination of acetophenones in a deep eutectic solvent

Zizhan Chen, Wei Zhu, Zubiao Zheng, Xinzhuo Zou

Department of Chemistry, East China Normal University, 3663 Zhongshan Road (N), Shanghai 200062, China

Two methods of nucleophilic fluorination to prepare α-fluoroacetophenones from α-bromoacetophenones by using KF with PEG-400 or TBAF with ZnF_2 are described. On the fundamental of nucleophilic fluorination, a novel method of one-pot fluorination to prepare α-fluoroacetophenones directly from acetophenones in DES was developed.



Method I: KF, PEG-400, acetonitrile, 80°C . Yields: 55~74%.

Method II: TBAF·3H_2O, ZnF_2, KF, acetonitrile, 80°C . Yields: 60~90%.

Method III: DES, DCDMH, TBAF·3H_2O, ZnF_2, acetonitrile, 80°C . Yields: 32~80%.

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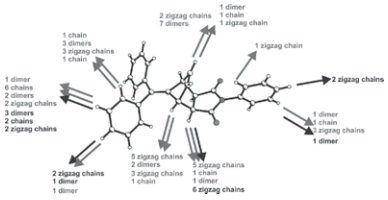
Involvement of organic fluorine substitution in the crystalline packing structures of tricyclic Diels–Alder adducts derived from diarylfulvenes and *N*-arylimides

Anke Schwarzer[a], Petra Bombicz[b], Edwin Weber[a]

[a]*Institute of Organic Chemistry, Technische Universität Bergakademie Freiberg, Leipziger Straße 29, D-09596 Freiberg, Sachsen, Germany*
[b]*Institute of Structural Chemistry, Chemical Research Center, Hungarian Academy of Sciences, H-1525 Budapest, Hungary*



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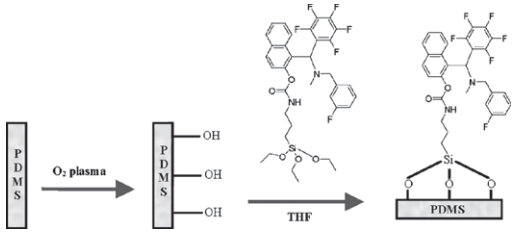
Modification of micro-channel filling flow by poly(dimethylsiloxane) surface functionalization with fluorine—Substituted aminonaphthols

G. Cortese[a], F. Martina[a], G. Vasapollo[a], R. Cingolani[b], G. Gigli[a,b], G. Ciccarella[a,b]

[a]*Università del Salento, Dipartimento di Ingegneria dell'Innovazione, via Arnesano, I-73100, Lecce, Italy*
[b]*National Nanotechnology Laboratory (NNL) of CNR, INFM, Distretto Tecnologico ISUFI, via Arnesano, I-73100, Lecce, Italy*

PDMS surface functionalization with fluorine-containing aminonaphthols results in a successful modification of microfluidic motion of water in rectangular capillaries, with the fluorinated aminonaphthols fuctionalized PDMS exhibiting higher filling times and contact angles.



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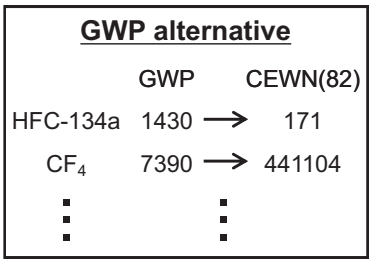
Evaluation of carbon dioxide equivalent values for greenhouse gases: CEWN as a new indicator replacing GWP

Akira Sekiya, Sayuri Okamoto

National Institute of Advanced Industrial Science and Technology (AIST), Central 5, 1-1-1 Higashi, Tsukuba, Ibaraki 305-8565, Japan

A new indicator, the CEWN (Carbon Dioxide Equivalent Warming Number), is proposed as an alternative to the GWP (Global Warming Potential). CEWN is a metric where the global warming by the emission of gases is compared unifying the removal rate of each gas from the atmosphere, using carbon dioxide as a reference.



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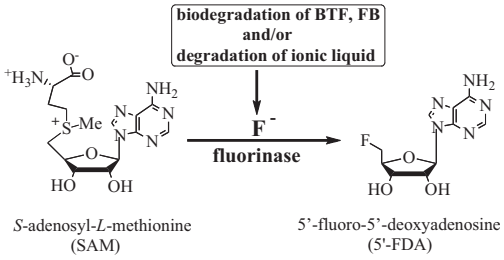
Enzymatic fluorination using fluoride ion generated from degradation of fluorinated materials

Noritaka Iwai, Yuto Tsuboki, Mami Kitazume, Tomoya Kitazume

Graduate School of Bioscience & Biotechnology, Tokyo Institute of Technology, 4259 Nagatsuta, Midori-ku Yokohama 226-8501, Japan



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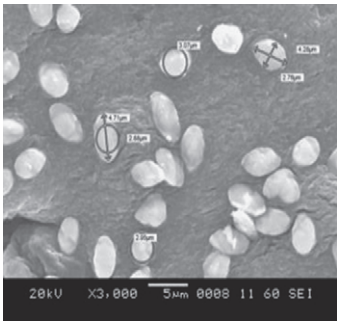
Synthesis of La-incorporated chitosan beads for fluoride removal from water

Dilip Thakre, Sneha Jagtap, Amit Bansiwal, Nitin Labhsetwar, Sadhana Rayalu

Environmental Materials Unit, National Environmental Engineering Research Institute, Nehru Marg, Nagpur 440 020, India

In the present study, lanthanum incorporated chitosan beads (LCB) has been synthesized and tested for fluoride removal from drinking water. LCB showed maximum fluoride adsorption capacity of 4.7 mg/g and negligible leaching of La^{3+} ions was observed. It is possible to regenerate LCB with 1 M ammonium chloride and showed 81.22% regeneration and therefore can be employed as potential defluoridating adsorbent.



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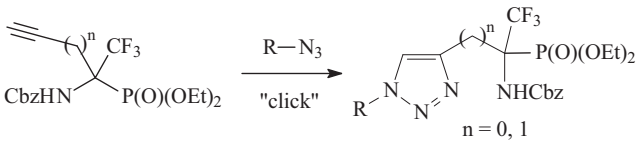
Synthesis of functionalized α-CF_3-α-aminophosphonates *via* Cu(I)-catalyzed 1,3-dipolar cycloaddition

Daria V. Vorobyeva[a], Natalya M. Karimova[a], Tamara P. Vasilyeva[a], Sergey N. Osipov[a], Grigory T. Shchetnikov[a], Irina L. Odinets[a], Gerd-V. Röschenthaler[b]

[a]*A.N. Nesmeyanov Institute of Organoelement Compounds, Russian Academy of Sciences, Vavilov str. 28, 119991 Moscow, Russia*
[b]*Jacobs University Bremen gGmbH, P.O. Box 750 561, D-28725 Bremen, Germany*

An efficient method for the synthesis of triazole-containing α-CF_3-α-aminophosphonates has been developed *via* Cu(I)-catalyzed (3+2)-cycloaddition of the corresponding alkynes to different organic azides.



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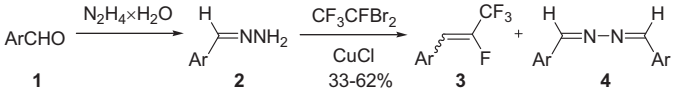
Novel efficient synthesis of β-fluoro-β-(trifluoromethyl)styrenes

Aleksey A. Goldberg[a], Vasiliy M. Muzalevskiy[a], Aleksey V. Shastin[b], Elisabeth S. Balenkova[a], Valentine G. Nenajdenko[a]

[a]*Moscow State University, Department of Chemistry, Leninskie Gory, Moscow 119992, Russia*
[b]*Institute of Problems of Chemical Physics, Chernogolovka, Moscow Region 142432, Russia*



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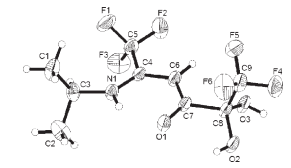
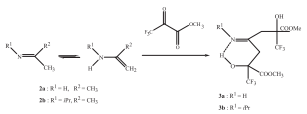
Facile synthetic pathway to β-hydroxy-β-trifluoromethyl imines and their derivatives

Ildikó Loop, Hanna Skarpos, Nataliya Kalinovich, Olesya Kazakova, Enno Lork, Gerd-Volker Röschenthaler

Institut für Anorganische and Physikalische Chemie, Universität Bremen, Leobener Strasse, D-28334 Bremen, Germany

Synthetic approach based on mediated addition of different trifluoromethylated building blocks to selected acyclic imines giving access to a variety of β-hydroxy-β-trifluoromethyl imines are elaborated. A reaction between fluorinated adducts and imines proceed easily giving the condensation products in good to excellent yields. β-Hydroxy-β-trifluoromethyl imines possessing trifluoromethyl group and exhibiting strong intramolecular hydrogen bonding are great precursors to different β-hydroxy-β-trifluoromethyl ketones and alcohols.





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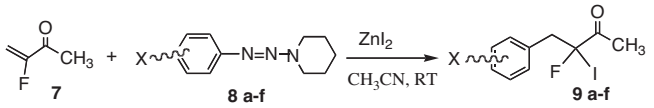
Meerwein arylation with 3-fluorobutenone

Timothy B. Patrick, Dennis Awasabisah

Department of Chemistry, Southern Illinois University, Edwardsville, IL 62026, USA

Geminal fluoro-iodo compounds **9a–9f** are prepared in the Meerwein arylation of 3-fluorobutenone with aryl triazines and zinc iodide.



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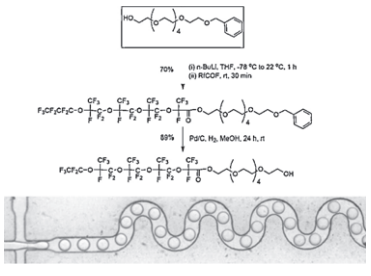
Synthesis of novel fluorous surfactants for microdroplet stabilisation in fluorous oil streams

Daniel J. Holt, Richard J. Payne, Chris Abell

University Chemical Laboratory, Lensfield Road, Cambridge CB2 1EW, UK

Synthesis of potential fluorosurfactant molecules and their use in formation of stable aqueous and organic microdroplets in microfluidic environments.



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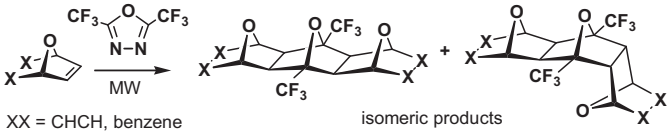
Reaction of 2,5-bis-trifluoromethyl-1,3,4-oxadiazole with 7-oxanorbornenes revisited: Experimental and quantum-chemical study of reaction stereoselectivity

Davor Margetić[a], Mirjana Eckert-Maksić[a], Pavle Trošelj[a], Željko Marinić[b]

[a]*Laboratory for Physical-Organic Chemistry, Division of Organic Chemistry and Biochemistry, Ruđer Bošković Institute, Bijenička cesta 54, 10001 Zagreb, Croatia*
[b]*Centre for NMR, Ruđer Bošković Institute, Bijenička cesta 54, 10001 Zagreb, Croatia*



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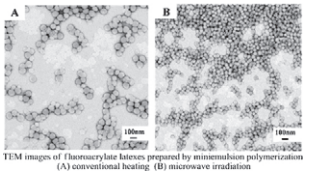
Preparation and characterization of fluorinated acrylate copolymer latexes by miniemulsion polymerization under microwave irradiation



TEM images of fluoroacrylate latexes prepared by miniemulsion polymerization (A) conventional heating (B) microwave irradiation

Shengdong Xiong[a], Xiaoli Guo[a], Ling Li[a], Shuilin Wu[a,b], Paul K. Chu[b], Zushun Xu[a,b]

[a]*Ministry-of-Education Key Laboratory for the Green Preparation and Application of Functional Materials, Hubei University, Wuhan 430062, China*
[b]*Department of Physics & Materials Science, City University of Hong Kong, Tat Chee Avenue, Kowloon, Hong Kong, China*

Fluoroacrylate latexes are prepared by miniemulsion polymerization under microwave irradiation and conventional heating using dodecafluoroheptyl methacrylate (DFHMA), butyl acrylate (BA), and methyl methylacrylate (MMA) as the raw materials. According to the TEM images and PCS measurement, the diameters of the latex particles prepared by microwave irradiation are smaller and more monodispersed than those prepared by conventional heating. Moreover, polymerization under microwave irradiation has a higher reaction rate and higher conversion than traditional heating. The effects of the kinetic parameters on the miniemulsion polymerization are investigated. The surface property and thermal stability of the latex films are also determined by contact angle, atomic force microscopy and thermo-gravimetric analyses.

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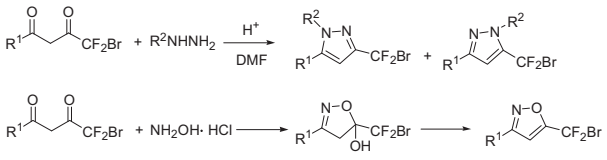
Synthesis of bromodifluoromethyl substituted pyrazoles and isoxazoles

Xueyan Yang[a], Shengxia Shui[a], Xi Chen[a], Hai'ou He[a], Fanhong Wu[a,b,c]

[a]*Key Laboratory for Advanced Materials and Institute of Fine Chemicals, East China University of Science and Technology, 130 Meilong Rd, Shanghai 200237, PR China*
[b]*The State Key Laboratory of Elemento-Organic Chemistry, Nankai University, PR China*
[c]*School of Chemical and Environmental Engineering, Shanghai Institute of Technology, 120 Caobao Rd., Shanghai 200235, PR China*



Bromodifluoromethyl substituted β-diketones reacted with aryl hydrazine derivatives or hydroxylamine hydrochloride affording corresponding bromodifluoromethyl substituted pyrazoles or dihydroisoxazoles, which proceeded dehydration to give bromodifluoromethyl substituted isoxazoles.

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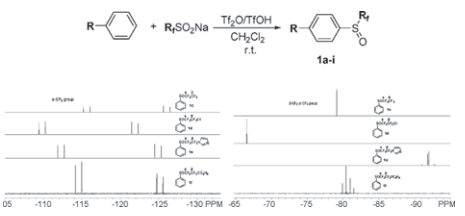
One-pot synthesis of arylfluoroalkylsulfoxides and study of their anomalous ^{19}F NMR behavior



Cheng-Pan Zhang[a], Zong-Ling Wang[a,b], Qing-Yun Chen[a], Chun-Tao Zhang[b], Ji-Chang Xiao[a]

[a]*Key Laboratory of Organofluorine Chemistry, Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences, 345 Lingling Road, Shanghai 200032, China*
[b]*Hunan University of Chinese Medicine, Changsha, Hunan Province 410208, China*

Arylfluoroalkylsulfoxides were successfully synthesized in one-pot when fluoroalkylsulfinate reacted with benzene and triflic anhydride in triflic acid and dichloromethane as the medium. The characteristics of their ^{19}F NMR spectra were examined and analyzed for these structures. Electronic and steric effects of substituents at α- or β-position were revealed to be the main cause of the anomalous behavior of their chemical shifts and coupling constants. Interactions between arylfluoroalkylsulfoxides and solvents were also investigated and discussed.

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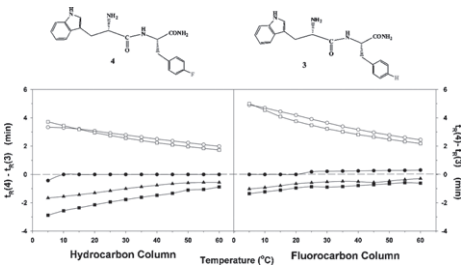
Separation of fluorinated amino acids and oligopeptides from their non-fluorinated counterparts using high-performance liquid chromatography

Nu Xiao[a], Y. Bruce Yu[a,b]

[a]*Department of Pharmaceutical Sciences, University of Maryland, Baltimore, MD 21201, United States*
[b]*Fischell Department of Bioengineering, University of Maryland, College Park, MD 20742, United States*



Chromatographic separation of fluorinated amino acids and oligopeptides from their non-fluorinated counterparts were investigated at various temperatures using both hydrocarbon and fluorocarbon eluents and columns. The results show that fluorinated amino acids and oligopeptides demonstrate preference toward fluorocarbon eluents and fluorocarbon column compared to their non-fluorinated counterparts.

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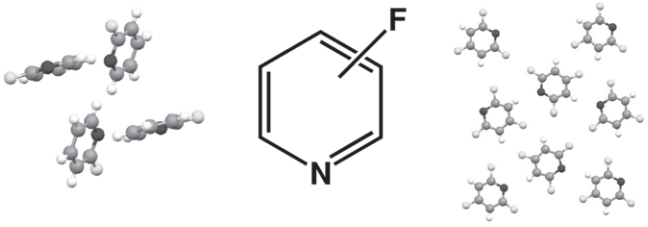
Aggregation of fluorine-substituted pyridines

Vera Vasylyeva, Klaus Merz

Chair of Inorganic Chemistry 1, Ruhr-University Bochum, Universitätsstrasse 150, D-44801 Bochum, Germany



From T-shape to coplanar arrangement: fluorine substituents determine the crystal packings of the low melting fluoropyridines 2-fluoropyridine, 2,6-difluoropyridine and 2,4,6-trifluoropyridine.