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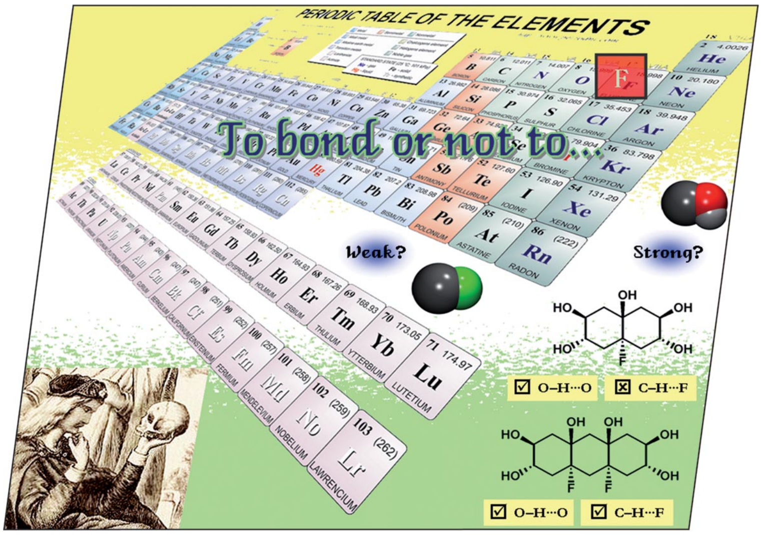
COVER PICTURE

The cover picture shows, with a wordplay of the famous phrase “To be or not to be ...” from William Shakespeare’s play *Hamlet*, the ambivalent nature of fluorine – the most electronegative element and known to form some of the strongest hydrogen bonds, as in $[F{-}H{\cdots}F]^-$. Notwithstanding this, “organic” fluorine makes some of the weakest hydrogen bonds (or none at all) known in molecular crystals. Our study, in this context, utilizes specially designed fluorinated polycyclitols to probe the capability of covalently bonded fluorine to engage itself in H-bonding even in the presence of its isostere – the hydroxy group. Details are discussed in the article by G. Mehta and S. Sen on p. 3387ff.



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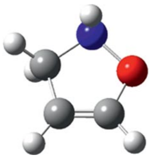
MICROREVIEW

4-Isoxazolines

T. M. V. D. Pinho e Melo* **3363–3376**

4-Isoxazolines: Scaffolds for Organic Synthesis

Keywords: 4-Isoxazolines / Pyrroles / Aziridines / Nitrones / Azomethine ylides / Amino alcohols / Nitrogen heterocycles / Oxygen heterocycles



This review provides coverage of the more relevant contributions to the synthesis of 4-isoxazolines and their reactivity as building blocks for both cyclic and acyclic compounds.

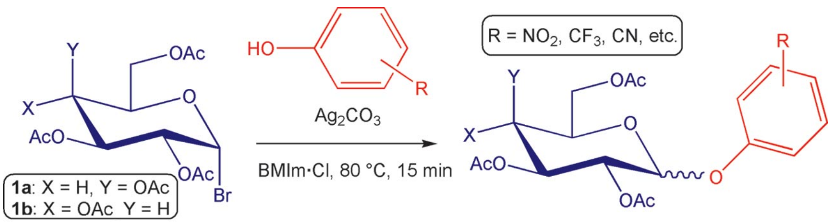
SHORT COMMUNICATIONS

Molten Salt Mediated *O*-Glycosidation

V. Kumar, I. J. Talisman,
S. V. Malhotra* **3377–3381**

Application of Halide Molten Salts as Novel Reaction Media for *O*-Glycosidic Bond Formation

Keywords: *O*-Glycosidation / Molten salts / Ionic liquids / Carbohydrates / Koenigs–Knorr reaction



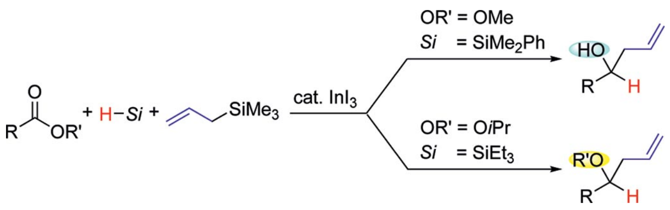
Molten halide salts have been used as novel reaction media for Koenigs–Knorr-type *O*-glycosidation reactions between glycosyl bromides and various phenolic acceptors. 1-Butyl-4-methylimidazolium chloride emerged as highly efficient and recyclable reaction medium.

Hydroallylation of Esters

Y. Nishimoto, Y. Inamoto, T. Saito,
M. Yasuda, A. Baba* **3382–3386**

Indium Triiodide Catalyzed Direct Hydroallylation of Esters

Keywords: Indium / Esters / Allylation / Hydrosilane / Allylsilanes



A new type of hydroallylation of esters was accomplished by using InI_3 as a catalyst, in which the production of either homoallylic alcohols or ethers could be freely selected by changing the substituents of the alkoxy moiety and of the hydrosilane. In addition, this reaction system has a high chemoselectivity that allows various functional groups (nitro, cyano, alkenyl, alkynyl, hydroxy) to survive.

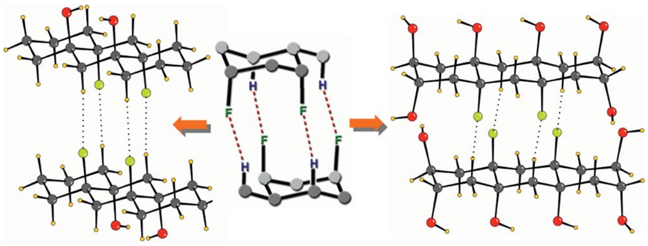
FULL PAPERS

Fluorinated Probes

G. Mehta,* S. Sen 3387–3394

Probing Fluorine Interactions in a Polyhydroxylated Environment: Conservation of a C–F···H–C Recognition Motif in Presence of O–H···O Hydrogen Bonds

Keywords: Alcohols / Alicyclic compounds / Fluorine / Hydrogen bonds / Non-covalent interactions



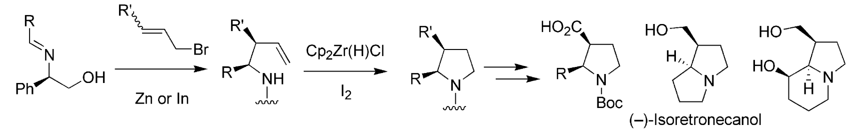
The crystal structures of three fluorinated polycyclitols, specially constructed on a rigid *trans*-decalin framework, reveal that C(sp^3)–F···H–C(sp^3) hydrogen bonds can indeed be observed with proper substrate design, and supramolecular recognition motifs, involving such interactions, can be conserved even in the presence of O–H···O hydrogen bonds.

Synthesis of Pyrrolidines

P.-O. Delaye, T. K. Pradhan, É. Lambert, J.-L. Vasse,* J. Szymoniak* ... 3395–3406

Diastereoselective Access to Enantiomerically Pure *cis*-2,3-Disubstituted Pyrrolidines

Keywords: Diastereoselectivity / Allylation / Alkaloids / Heterocycles / Imines



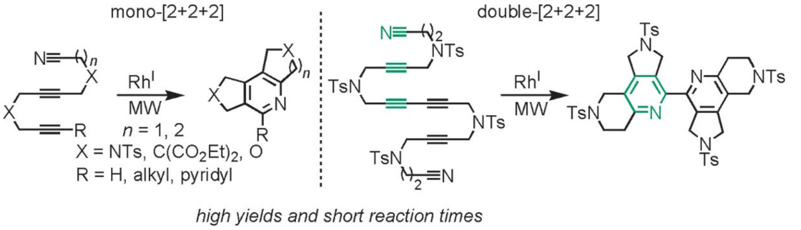
The development of a simple route to enantiomerically pure 2,3-disubstituted pyrrolidines is presented. The strategy involves a diastereoselective allylation of (*R*)-phenylglycinol-derived imines followed by a cyclization promoted by a hydrozirconation–iodination sequence. The selectivity and simplicity of the method offer various applications, as illustrated within.

Tricyclic-Fused Pyridines

L. Garcia, A. Pla-Quintana,* A. Roglans,* T. Parella 3407–3415

Microwave-Enhanced Rhodium-Catalyzed [2+2+2] Cycloaddition Reactions To Afford Highly Functionalized Pyridines and Bipyridines

Keywords: Cycloaddition / Microwave chemistry / Rhodium / Nitrogen heterocycles / Fused-ring systems



A series of cyanodiynes was subjected to a Rh^{I}-catalyzed [2+2+2] cycloaddition reaction to afford efficiently tricyclic-fused pyridines and bipyridines. Microwave heating in the appropriate solvent, as well as conventional heating in some cases, were effective in promoting the reaction.

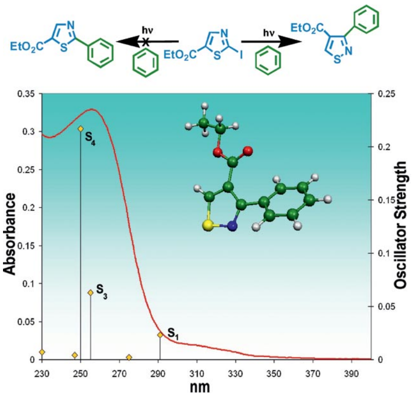
Photoisomerization of Arylthiazoles

M. Amati,* S. Belviso, M. D'Auria, F. Lelj, R. Racioppi,* L. Viggiani 3416–3427

Tandem Photoarylation–Photoisomerization of Halothiazoles: Synthesis, Photophysical and Singlet Oxygen Activation Properties of Ethyl 2-Arylthiazole-5-carboxylates

Keywords: Heterocycles / Photochemistry / Arylation / Isomerization / Density functional calculations

An unusual photoarylation–photoisomerization of ethyl 2-iodothiazole-5-carboxylate is described. Photophysical and singlet oxygen activation properties are also reported.



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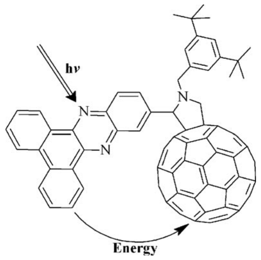
Photoinduced Energy Transfer

R. K. Dubey,* T. Kumpulainen, A. Efimov,
N. V. Tkachenko,
H. Lemmetyinen 3428–3436

Close Proximity Dibenzo[*a*,*c*]phenazine–Fullerene Dyad: Synthesis and Photoinduced Singlet Energy Transfer

Keywords: Fullerenes / Energy transfer / Energy conversion / Donor-acceptor systems / Photochemistry



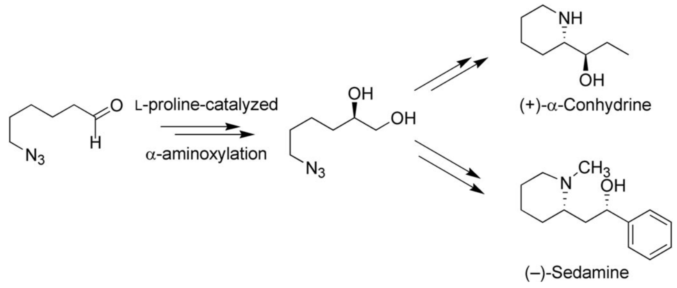
Synthesis and photophysical properties of a close-proximity dibenzo[*a*,*c*]phenazine–fullerene dyad are reported.

Alkaloids by Organocatalysis

T. M. Shaikh, A. Sudalai* 3437–3444

Enantioselective Synthesis of (+)-α-Conhydrine and (–)-Sedamine by L-Proline-Catalysed α-Aminooxylation

Keywords: Aminooxylation / Alkaloids / Amino acids / Organocatalysis / Enantioselectivity



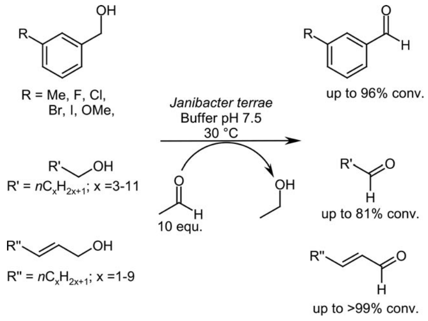
The piperidine ring is a ubiquitous structural motif present in numerous naturally occurring alkaloids and can be frequently recognized in the structures of drug candidates. Conhydrine and sedamine are two such alkaloids, and their enantioselective synthesis has been achieved in good overall yields.

Biooxidation

T. Orbegozo, J. G. de Vries,
W. Kroutil* 3445–3448

Biooxidation of Primary Alcohols to Aldehydes through Hydrogen Transfer Employing *Janibacter terrae*

Keywords: Biocatalysis / Oxidation / Alcohols / Aldehydes / Hydrogen transfer



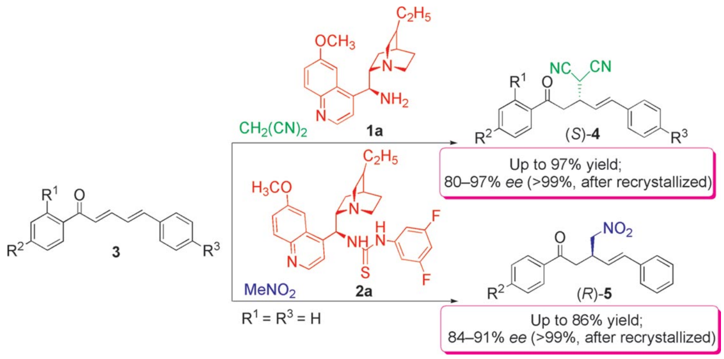
Lyophilized cells of *Janibacter terrae* were employed for the chemoselective oxidation of primary alcohols to the corresponding aldehydes by oxidative hydrogen transfer. Acetaldehyde was employed as the final hydrogen acceptor. The substrate spectrum was investigated as well as the tolerance of the biocatalyst toward organic solvents.

Organocatalysis

C. G. Oliva, A. M. S. Silva,*
D. I. S. P. Resende, F. A. A. Paz,
J. A. S. Cavaleiro 3449–3458

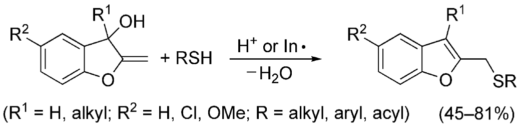
Highly Enantioselective 1,4-Michael Additions of Nucleophiles to Unsaturated Aryl Ketones with Organocatalysis by Bifunctional Cinchona Alkaloids

Keywords: Asymmetric catalysis / Organocatalysis / Enantioselectivity / Regioselectivity / Ketones / Michael addition



Asymmetric 1,4-Michael additions of malononitrile and nitromethane to a wide spectrum of α,β,γ,δ-unsaturated aryl ketones assisted by organocatalysis by bifunctional cinchona alkaloids have been developed. The reactions afforded excellent enantioselectivities (up to 99%), high yields (up to 97%), and exclusive regioselectivities.

Heterocyclic Chemistry



Readily available 2-methylene-2,3-dihydrobenzofuran-3-ols are smoothly converted into 2-thiomethylbenzofurans by acid-catalysed or radical-promoted allylic substitution with thiol derivatives as co-reagents. Reactions are carried out under mild conditions (DME, 90 °C) in the presence either of H_2SO_4 (acid-catalysed process) or of AIBN or BP (radical-promoted process).

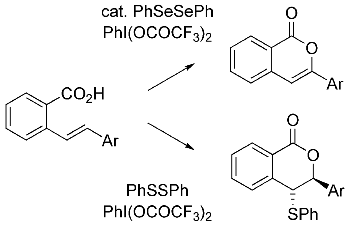
B. Gabriele,* R. Mancuso, G. Salerno **3459–3464**

Acid-Catalysed or Radical-Promoted Allylic Substitution of 2-Methylene-2,3-dihydrobenzofuran-3-ols with Thiol Derivatives: a Novel and Expedient Synthesis of 2-(Thiomethyl)benzofurans

Keywords: Allylic substitution / Benzofurans / Thioethers / Oxygen heterocycles / Nucleophilic substitution / Radical reactions

Selenium Catalysis

A diselenide-catalyzed approach to the synthesis of isocoumarins has been developed by employing hypervalent iodine reagents to effect cyclizations of stilbenecarboxylic acids under very mild reaction conditions. We have first time shown that diselenides and disulfides can be used for the selective synthesis of either isocoumarins or dihydroisocoumarins.



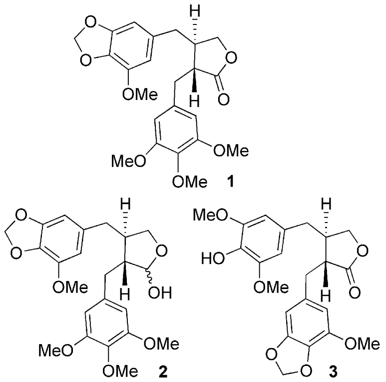
S. A. Shahzad, C. Venin, T. Wirth* **3465–3472**

Diselenide- and Disulfide-Mediated Synthesis of Isocoumarins

Keywords: Homogeneous catalysis / Cyclization / Diselenides / Isocoumarins

Natural Product Synthesis

A concise synthetic route to the 2,3-dibenzylbutyrolactone core has been developed, whereby the total synthesis of natural lignans **1**, **2**, and **3**, in racemic form, in an overall yield of 25, 18, and 19%, respectively, has been accomplished.

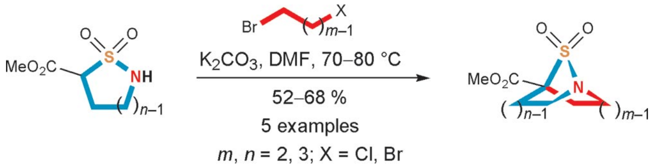


P. K. Amancha, H.-J. Liu,* T. W. Ly, K.-S. Shia* **3473–3480**

General Approach to 2,3-Dibenzyl-γ-butyrolactone Lignans: Application to the Total Synthesis of (±)-5′-Methoxyyatein, (±)-5′-Methoxyclusin, and (±)-4′-Hydroxycubebinone

Keywords: Lignans / Natural products / Lactones / Total synthesis / Synthetic methods

Bicyclic Sultams



Bicyclic sultams with 1-azathiabicyclo[2.2.1]heptane, -bicyclo[3.2.1]octane, and -bicyclo[3.3.1]nonane skeletons have been prepared by direct twofold inter/intramolecular alkylation of corresponding monocyclic sultams with α,ω-dihalides in 56, 68, 52 and 52% yield.

V. A. Rassadin, D. S. Grosheva, A. A. Tomashevskiy, V. V. Sokolov,* D. S. Yufit, S. I. Kozhushkov, A. de Meijere* **3481–3486**

Bicyclic Sultams with a Nitrogen at the Bridgehead and a Sulfur Atom in the Apex Position: Facile Preparation and Conformational Properties

Keywords: Bridged sultams / Conformational analysis / Cyclization / Oxidative deprotection / Solid-state structures

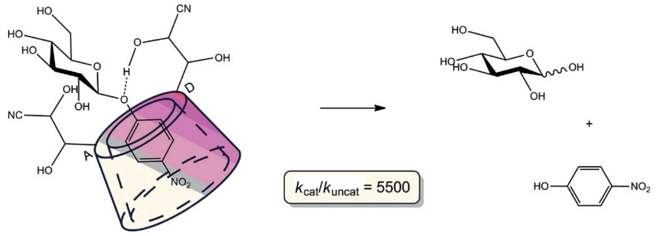
CONTENTS

Artificial Enzymes

J. Bjerre, M. Bols* **3487–3500**

Substantial Spatial Flexibility and Hydrogen Bonding within the Catalysis Exerted by Cyclodextrin Artificial Glycosidases

Keywords: Supramolecular catalysis / Artificial enzyme / Chemzyme / Synthetic Biology / Biomimetic chemistry / Cyclodextrins / Glycosidase



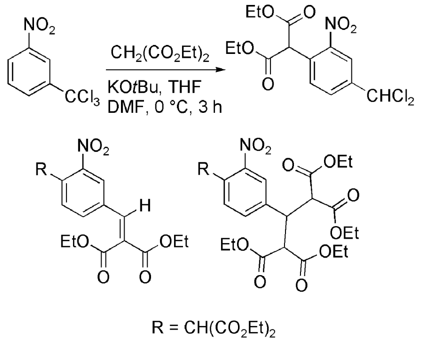
A new cyclodextrin cyanohydrin is the best artificial glycosidase at neutral pH and low phosphate concentration reported so far. Under the best conditions the hydrolysis of 4-nitrophenyl glucoside is accelerated up to 5500 times.

tele Nucleophilic Substitution

M. Surowiec, D. Belekos, M. Mąkosza,*
G. Varvounis* **3501–3506**

tele Nucleophilic Substitutions of Hydrogen in *m*-(Trichloromethyl)nitrobenzenes with Cyano and Ester Carbanions

Keywords: Carbanions / Michael addition / Arenes / Nucleophilic substitution / Elimination



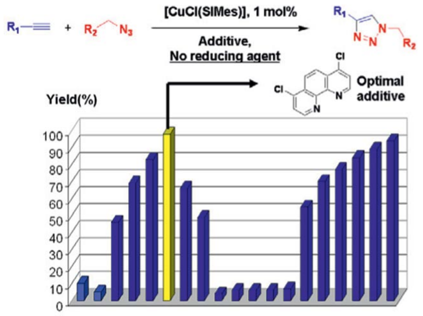
Carbanions derived from malonates react with electron-deficient *m*-(trichloromethyl)nitrobenzenes to give products of *tele* nucleophilic substitution, together with products of further substitution of the *tele* products. The outcomes of these reactions depend to some extent on the stoichiometry of the reagents and the temperature of the reaction.

Reductant-Free CuAAC

M.-L. Teyssot, L. Nauton, J.-L. Canet,
F. Cisnetti, A. Chevry,
A. Gautier **3507–3515**

Aromatic Nitrogen Donors for Efficient Copper(I)–NHC CuAAC under Reductant-Free Conditions

Keywords: Click chemistry / CuAAC / Heterocycles / Carbenes / Copper



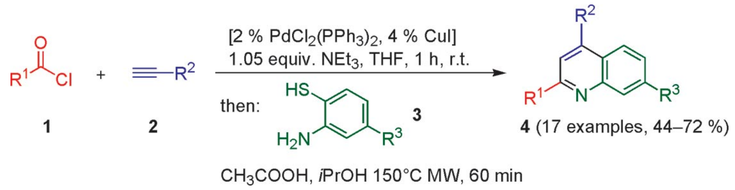
The alliance of a copper(I)–N-heterocyclic carbene with 4,7-dichloro-1,10-phenanthroline allows efficient copper(I)-catalysed azide–alkyne cycloaddition (CuAAC) at 1 mol-% loading in the absence of reducing agents. The catalyst is stable and can be stored, thereby allowing easier routine use.

Quinoline Synthesis

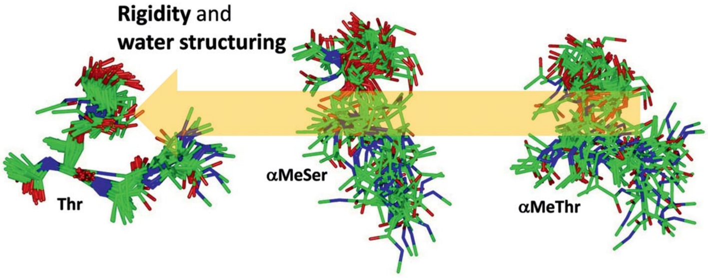
S. Rotzoll, B. Willy, J. Schönhaber,
F. Rominger, T. J. J. Müller* ... **3516–3524**

Regiospecific Three-Component Access to Fluorescent 2,4-Disubstituted Quinolines via One-Pot Coupling-Addition-Cyclocondensation-Sulfur Extrusion Sequence

Keywords: Multicomponent reactions / C-C coupling / Fluorescence / Microwave chemistry / Quinolines / Computations



2,4-Di- and 2,4,7-trisubstituted quinolines are readily synthesized from acyl chlorides, terminal alkynes, and 2-aminothiophenols by a consecutive, microwave-assisted one-pot three-component coupling–cyclocondensation–sulfur extrusion sequence. The quinolines display intense blue fluorescence and their spectral properties can be rationalized by rapid DFT-ZINDO-CI calculations.



The synthesis and the conformational analysis of three antifreeze-like glycopeptides containing a threonine (Thr) or the non-natural amino acids α-methylserine or α-methylthreonine are reported. The different behaviors of these molecules in both dynamics and hydration properties makes them suitable systems to shed light on the key factors that govern antifreeze activity.

F. Corzana,* J. H. Busto,
M. García de Luis, A. Fernández-Tejada,
F. Rodríguez, J. Jiménez-Barbero,
A. Avenoza,
J. M. Peregrina* 3525–3532

Dynamics and Hydration Properties of Small Antifreeze-Like Glycopeptides Containing Non-Natural Amino Acids

Keywords: Glycopeptides / Conformation analysis / NMR spectroscopy / Molecular dynamics

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* Author to whom correspondence should be addressed.

Supporting information on the WWW (see article for access details).