Reactivity and Selectivity in Glycosylation Reactions

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List of abbreviations

Ac	acetyl
AIBN	2,2'-azobis(2-methyl-propionitrile)
All	allyl
APT	attached proton test
aq.	aqueous
Ar	aryl
Ara	arabinose
AraA	arabinuronic acid
AraF	2-deoxy-2-fluoro arabinose
$AraN_3$	2-azido-2-deoxy arabinose
Arom	aromatic
B	boat
B3LYP	Becke, 3-parameter, Lee-Yang-Parr
BAIB	(diacetoxyiodo)benzene
BDA	butane-2,3-diacetal
Bn	benzyl
bs	broad singlet
Bu	butyl
Bz	benzoyl
C	chair
cal	calorie
calcd	calculated
cat.	catalytic
CBz	carboxybenzyl
CEL	conformational energy landscape
CIP	contact ion pair
COSY	correlation spectroscopy
C_q	quaternary carbon atom
CSA	camphor-10-sulfonic acid
Cy	cyclohexyl
δ	chemical shift (ppm)
d	doublet
DAST	diethylaminosulfur trifluoride
DBU	1,8-diazabicyclo[5.4.0]undec-7-ene
DCE	1,2-dichloroethane
DCM	dichloromethane
dd	double doublet
ddd	doublet of double doublets
dddd	double doublet of double doublets
ddt	doublet of double triplets
DEAD	diethyl azocarboxylate
DFE	difluorethanol
DFT	density function theory
DiPEA	diisopropylethylamine
DMAP	4-dimethylaminopyridine
DMF	dimethylformamide
DMM	dimethylmaleimide
DMSO	dimethylsulfoxide
DNPY	dinitropyridone
dq	double quartet
dt	double triplet
dtd	doublet of triple doublets
DTBMP	2,6-di-*tert*-butyl-4-methylpyridine
DTBS	di-*tert*-butylsilylidene
E	energy
E	envelope
eq.	molar equivalent
Et	ethyl
E-X	electrophilic activator system
F	field-inductive parameter
f	Fukui value
FT	Fourier transform
gg	gauche-gauche
gt	gauche-trans
GATED	proton decoupling applied only during relaxation
Gal	galactose
Glc	glucose
GlcA	glucuronic acid
GlcN	glucosamine
$GlcN_3$	2-azido-2-deoxy glucose
GlcNAc	*N*-acetyl glucosamine
h	hour(s)
H	half-chair
HECADE	heteronuclear couplings from aSSCI-domain experiments with E.COSY-type cross peaks
HFIP	hexafluoro-*iso*-propanol
HMBC	heteronuclear multiple-bond correlation spectroscopy
HOMO	highest occupied molecular orbital
HPLC	high performance liquid chromatography
HRMS	high-resolution mass spectroscopy
HSQC	heteronuclear single quantum coherence
IR	infrared
J	coupling constant
KIE	kinetic isotope effect
LC-MS	liquid chromatography - mass spectrometry

LG	leaving group
LTQ	linear trap quadropole
LUMO	lowest unoccupied molecular orbital
Lyx	lyxose
LyxA	lyxuronic acid
LyxF	2-deoxy-2-fluoro lyxose
$LyxN_3$	2-azido-2-deoxy lyxose
M	molar
m	multiplet
m.s.	molecular sieves
m/z	mass over charge ratio
min	minutes
Man	mannose
ManA	mannuronic acid
Me	methyl
MFE	monofluoroethanol
M.S.	molecular sieves
N	Mayr's nucleophilicity parameter
N-PSP	*N*-(phenylseleno)phthalimide
Nap	2-methylnaphthyl
NBS	*N*-bromosuccinimide
NFM	*N*-formylmorpholine
NIS	*N*-iodosuccinimide
NMR	nuclear magnetic resonance
NMP	*N*-methyl-2-pyrrolidone
NOESY	nuclear Overhauser effect spectroscopy
Nu	nucleophile
p	para
P	protection group
PCM	polarizable continuum model
PET	positron-emission tomography
PFBS-F	perfluorobutanesulfonyl fluoride
Ph	phenyl
Phth	phthaloyl
pK_a	$-\log_{10}$ (acid dissociation constant)
PMB	4-methoxybenzyl
ppm	parts per million
q	quartet
q	atomic charge
qd	quartet of doublets
r.t.	room temperature
R_f	retention factor
RDAS	reciprocal donor-acceptor selectivity
Rib	ribose
RibA	riburonic acid
RibF	2-deoxy-2-fluoro ribose
$RibN_3$	2-azido-2-deoxy ribose
RRV	relative reactivity value
s	singlet
s	chemical softness
S	skew boat
sat.	saturated
S_N1	uni-molecular nucleophilic substitution
S_N2	bi-molecular nucleophilic substitution
SSIP	solvent-separated ion pair
t	triplet
t	*tert*-
T	twist
Taz	tiazolinyl
tg	trans-gauge
TBAF	tetrabutylammonium fluoride
TBAI	tetrabutylammonium iodide
TBAT	tetrabutylammonium triphenylsilyl difluoride
TBS	*tert*-butyldimethylsilyl
TBDMS	*tert*-butyldimethylsilyl
TBDPS	*tert*-butyldiphenylsilyl
TCA	trichloroacetyl
TES	triethylsilyl
TEMPO	2,2,6,6-tetramethylpiperidine
TFA	trifluoroacetic acid
TFE	trifluoroethanol
Tf	triflyl; trifluoromethanesulfonyl
THF	tetrahydrofuran
TIPS	tri-*iso*-propylsilyl
TLC	thin layer chromatography
TMEDA	tetramethylethylenediamine
TMS	trimethylsilyl
TOCSY	total correlation spectroscopy
Tol	tolyl; 4-methylphenyl
Trt	trityl; triphenylmethyl
Ts	tosyl; 4-methylbenzene-1-sulfonyl
TS	transition state
td	triple doublet
tt	triple triplet
TTBP	2,4,6-tri-*tert*-butylpyrimidine
UDP	uridine diphosphate
UV	ultraviolet
VT	variable temperature
Xyl	xylose
XylA	xyluronic acid
XylF	2-deoxy-2-fluoro xylose
$XylN_3$	2-azido-2-deoxy xylose
ZPE	zero-point energy