

Supporting Information

Stereoselective Pd-Catalyzed Etherification and Asymmetric Synthesis of Furanomycin and its analogs from Chiral Aziridine

Jae-Hoon Jung,^a Doo-Ha Yoon,^a Kyuwoog Lee,^b Hyeonah Shin,^b Won Koo Lee*,^b Cheol-min Yook,^a and Hyun-Joon Ha*^a

^aDepartment of Chemistry and Protein Research Centre for Bio-Industry, Hankuk University of Foreign Studies, Yongin, 449-719, Korea.

^bDepartment of Chemistry, Sogang University, Seoul 121-742, Korea.

¹H and ¹³C NMR Spectra

Synthesis of L-(+)-furanomycin

(2R)-2-((1R,E)-1-((S)-But-3-en-2-yloxy)but-2-en-1-yl)-1-((R)-1-phenylethyl)aziridine (3a)	S2
(2R)-2-((E)-1-((E)-but-2-en-1-yloxy)but-2-en-1-yl)-1-((R)-1-phenylethyl)aziridine (3d)	S3
(R)-2-((2R,5S)-5-Methyl-2,5-dihydrofuran-2-yl)-1-((R)-1-phenylethyl)aziridine (4a)	S4
(R)-4-((2R,5S)-5-Methyl-2,5-dihydrofuran-2-yl)-3-((R)-1-phenylethyl)oxazolidin-2-one (5a)	S5
(R)-4-((2R,5S)-5-Methyl-2,5-dihydrofuran-2-yl)oxazolidin-2-one (6a)	S6
<i>tert</i> -Butyl ((R)-2-hydroxy-1-((2R,5S)-5-methyl-2,5-dihydrofuran-2-yl)ethyl)carbamate (7a)	S7
(S)-2-((<i>tert</i> -Butoxycarbonyl)amino)-2-((2R,5S)-5-methyl-2,5-dihydrofuran-2-yl)acetic acid (8a)	S8

Synthesis of 5'-*epi*-furanomycin

(2R)-2-((1R,E)-1-((S)-But-3-en-2-yloxy)but-2-en-1-yl)-1-((R)-1-phenylethyl)aziridine (3b)	S9
(R)-2-((2R,5R)-5-Methyl-2,5-dihydrofuran-2-yl)-1-((R)-1-phenylethyl)aziridine (4b)	S10
(R)-4-((2R,5R)-5-Methyl-2,5-dihydrofuran-2-yl)-3-((R)-1-phenylethyl)oxazolidin-2-one (5b)	S11
(R)-4-((2R,5R)-5-Methyl-2,5-dihydrofuran-2-yl)oxazolidin-2-one (6b)	S12
<i>tert</i> -Butyl ((R)-2-hydroxy-1-((2R,5R)-5-methyl-2,5-dihydrofuran-2-yl)ethyl)carbamate (7b)	S13
(S)-2-((<i>tert</i> -Butoxycarbonyl)amino)-2-((2R,5R)-5-methyl-2,5-dihydrofuran-2-yl)acetic acid (8b)	S14

COSY and NOESY spectra of **5a** and **5b**

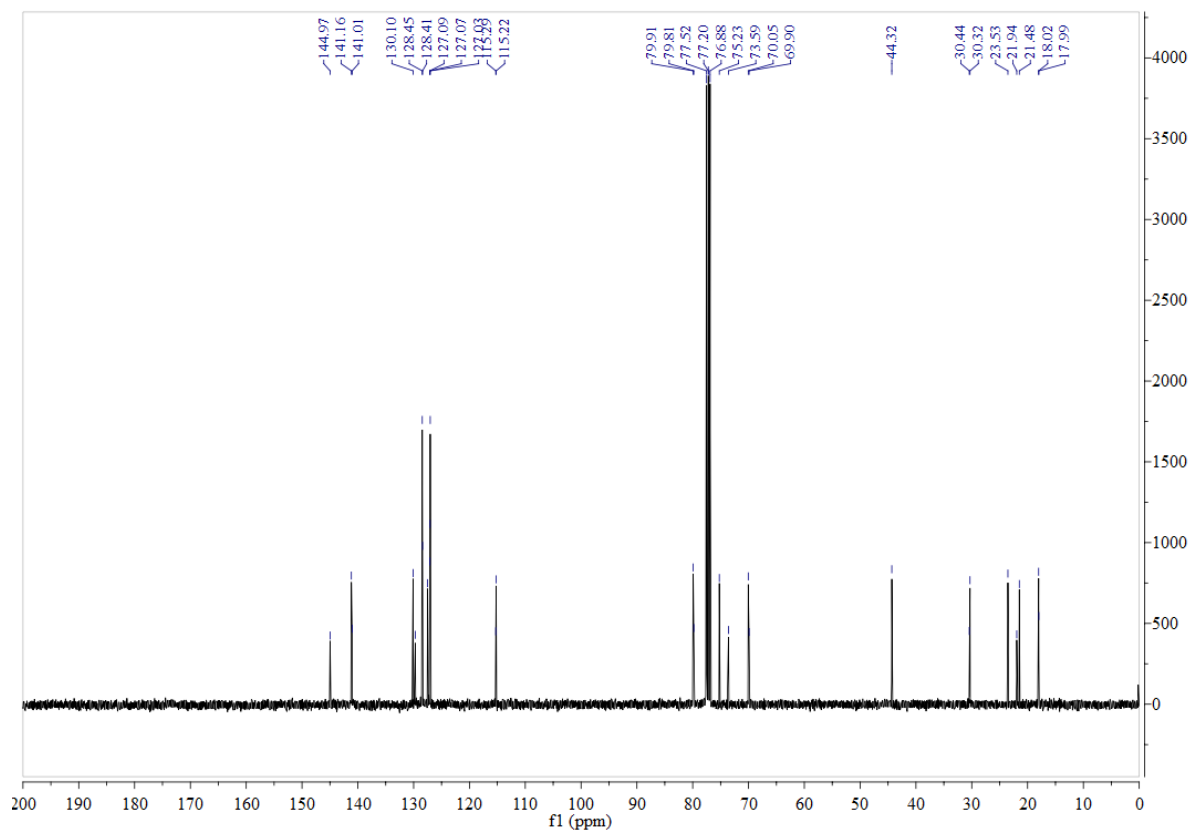
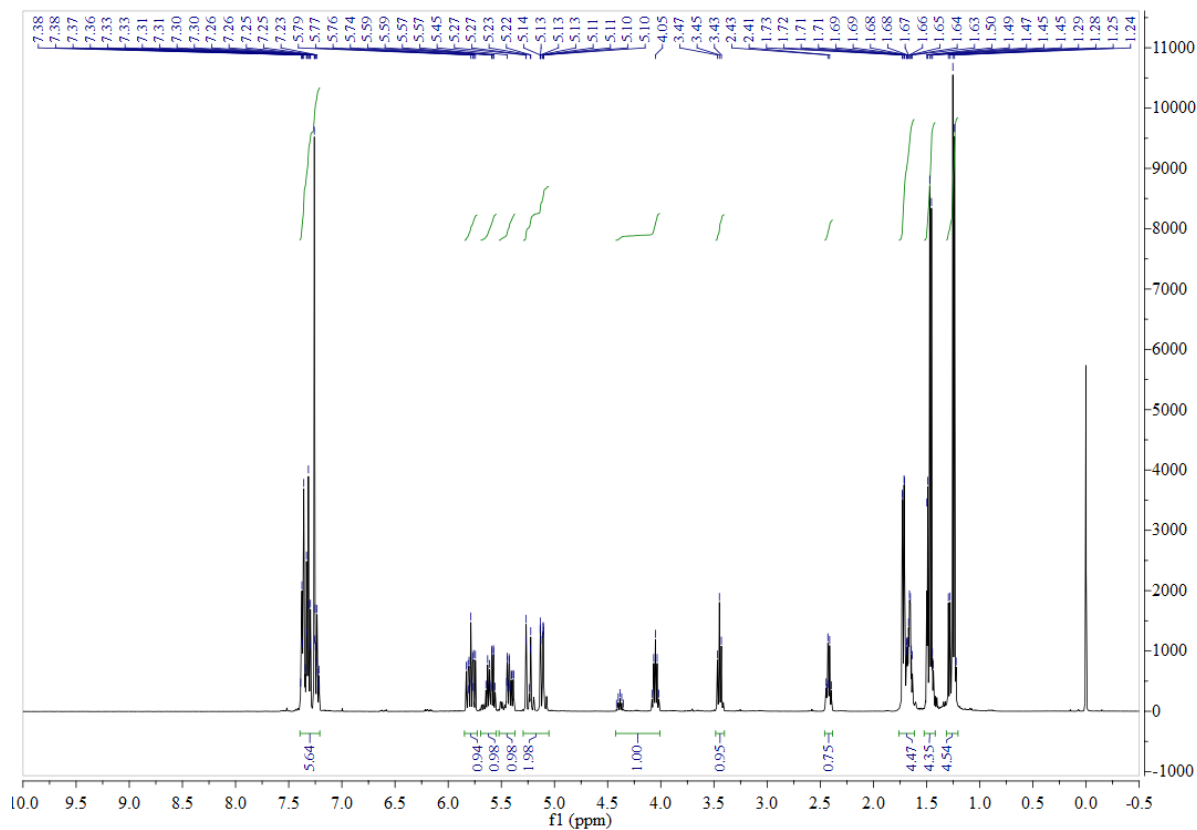
(R)-4-((2R,5S)-5-Methyl-2,5-dihydrofuran-2-yl)-3-((R)-1-phenylethyl)oxazolidin-2-one (5a)	S15
(R)-4-((2R,5R)-5-Methyl-2,5-dihydrofuran-2-yl)-3-((R)-1-phenylethyl)oxazolidin-2-one (5b)	S16

Synthesis of Norfuranomycin

(R)-2-((R,E)-1-(Allyloxy)but-2-enyl)-1-((R)-1-phenylethyl)aziridine (3c)	S17
(R)-2-((R)-2,5-Dihydrofuran-2-yl)-1-((R)-1-phenylethyl)aziridine (4c)	S18
(R)-4-((R)-2,5-Dihydrofuran-2-yl)-3-((R)-1-phenylethyl)oxazolidin-2-one (5c)	S19
(R)-4-((R)-2,5-Dihydrofuran-2-yl)oxazolidin-2-one (6c)	S20
<i>tert</i> -Butyl ((R)-((R)-2,5-dihydrofuran-2-yl)(hydroxy)methyl)carbamate (7c)	S21
(S)-2-((<i>tert</i> -Butoxycarbonyl)amino)-2-((R)-2,5-dihydrofuran-2-yl)acetic acid (8c)	S22

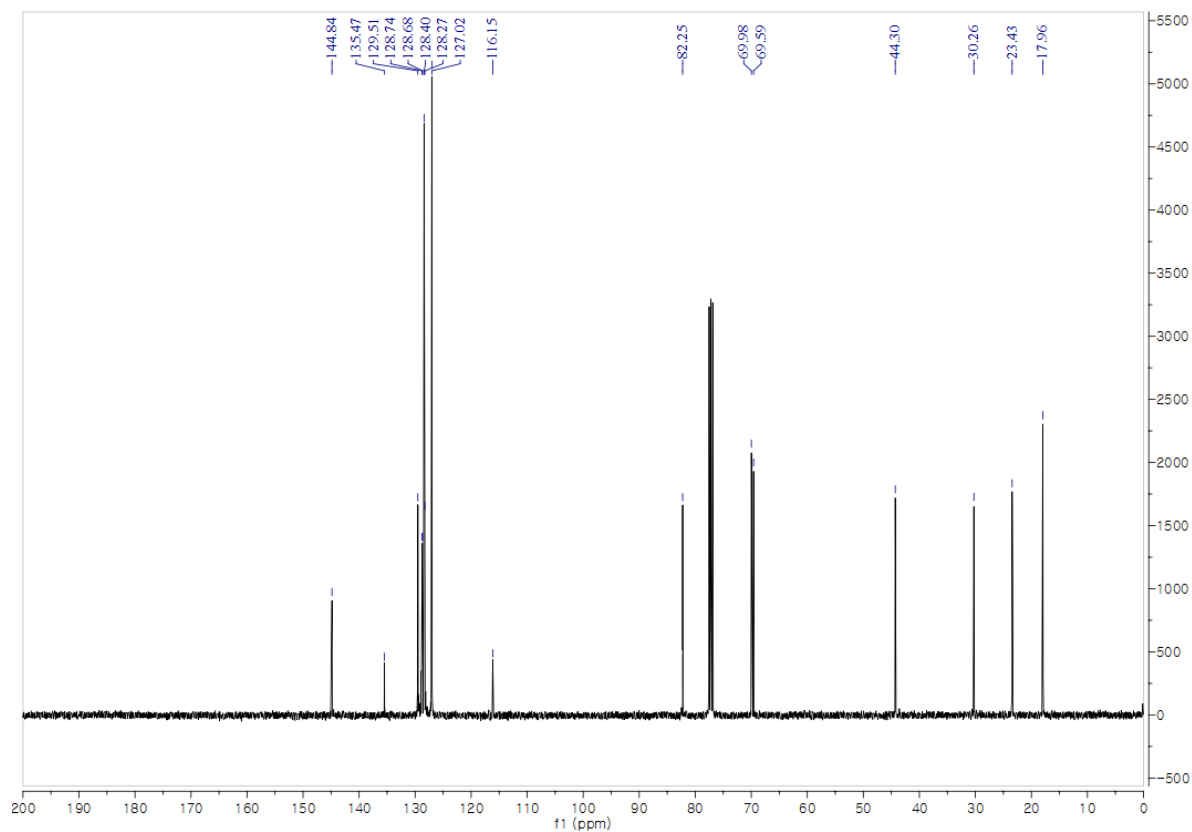
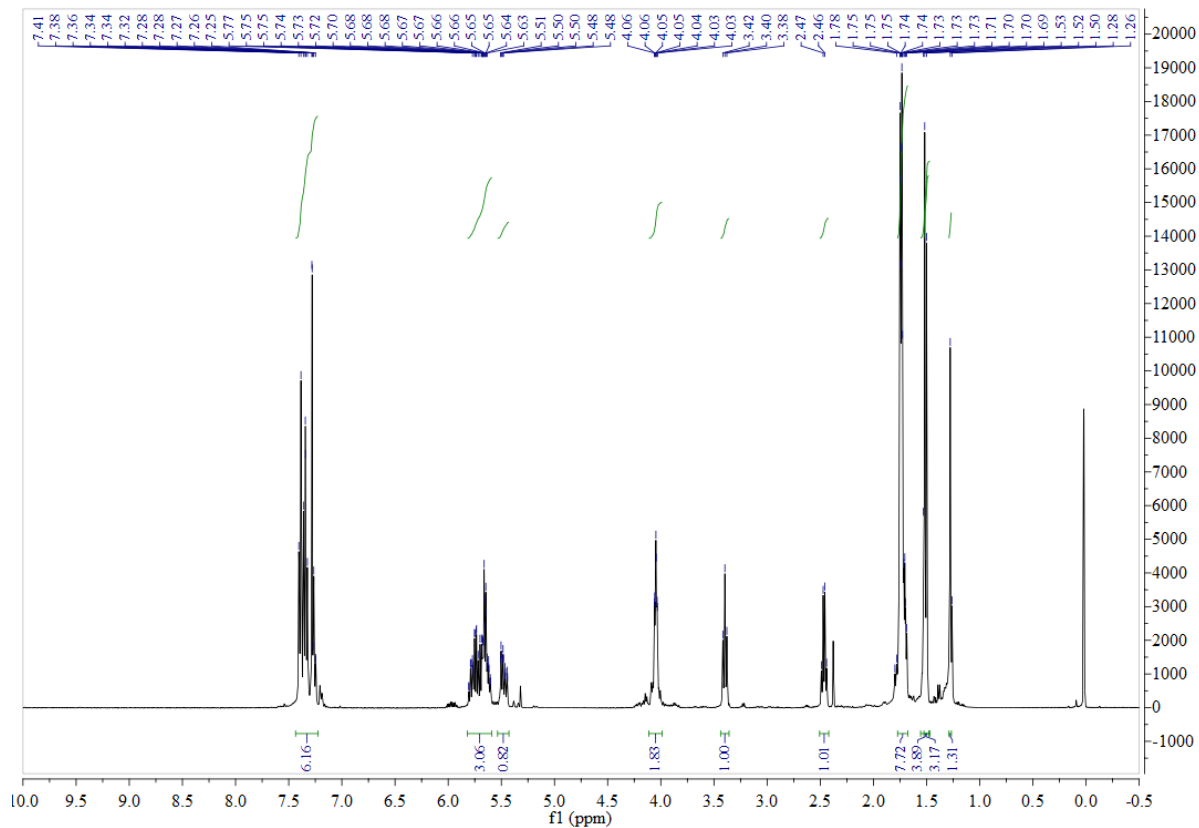
Synthesis of L-(+)-Furanomycin

(2*R*)-2-((1*R,E*)-1-((*S*)-But-3-en-2-yloxy)but-2-en-1-yl)-1-((*R*)-1-phenylethyl)aziridine (**3a**)



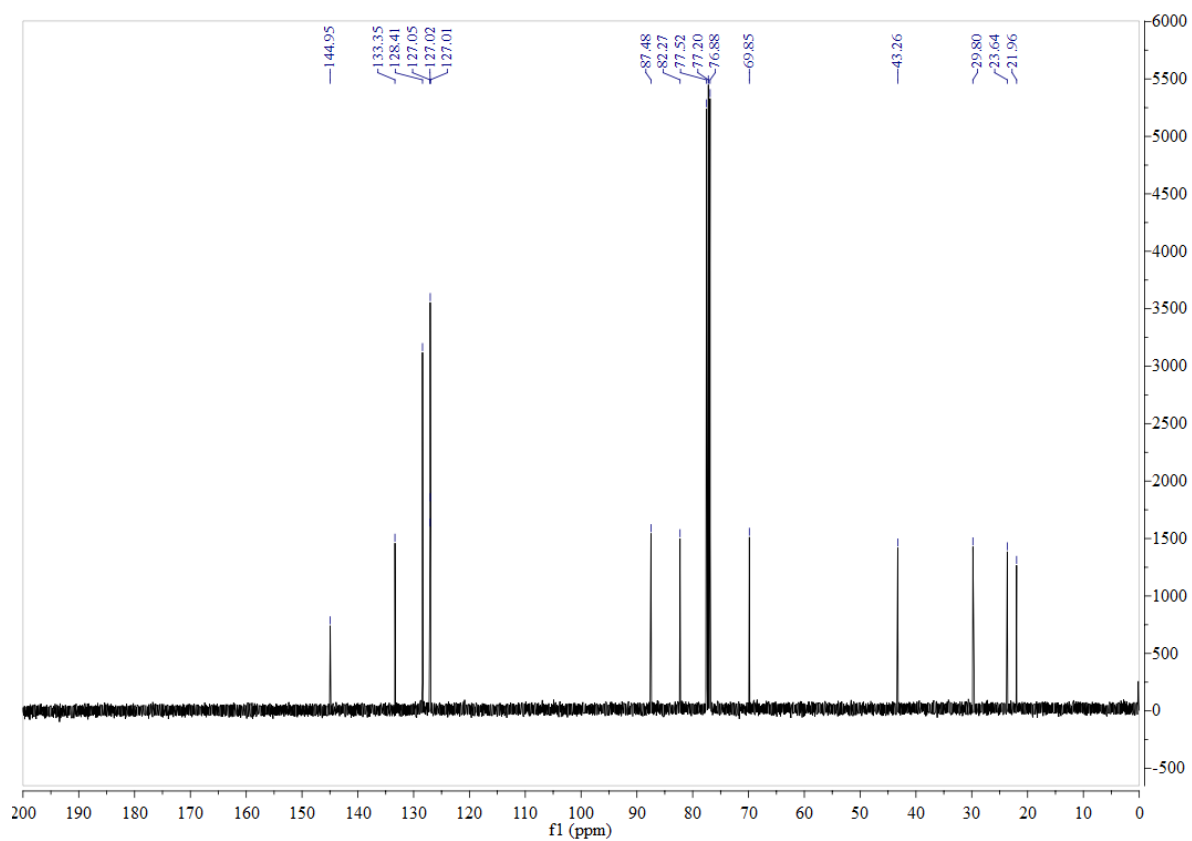
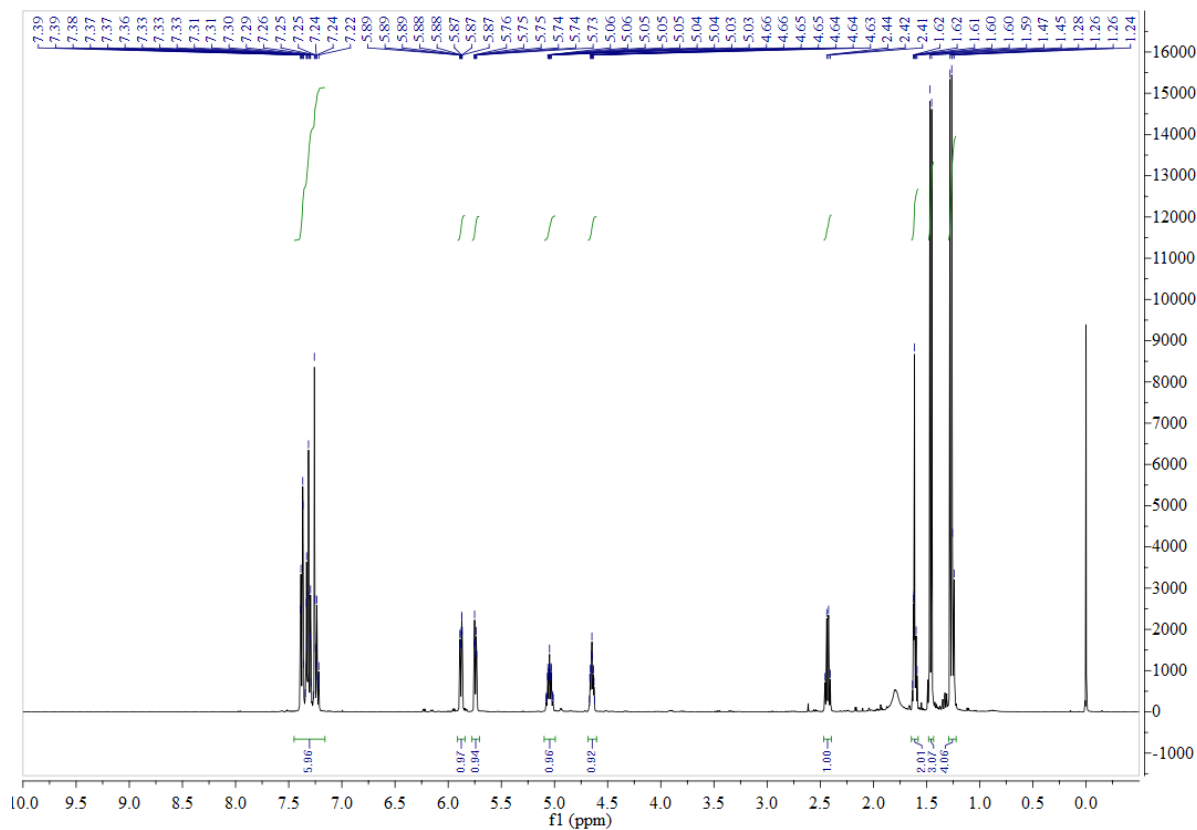
Synthesis of L-(+)-Furanomycin

(2*R*)-2-((*E*)-1-((*E*)-but-2-en-1-yloxy)but-2-en-1-yl)-1-((*R*)-1-phenylethyl)aziridine (**3d**)



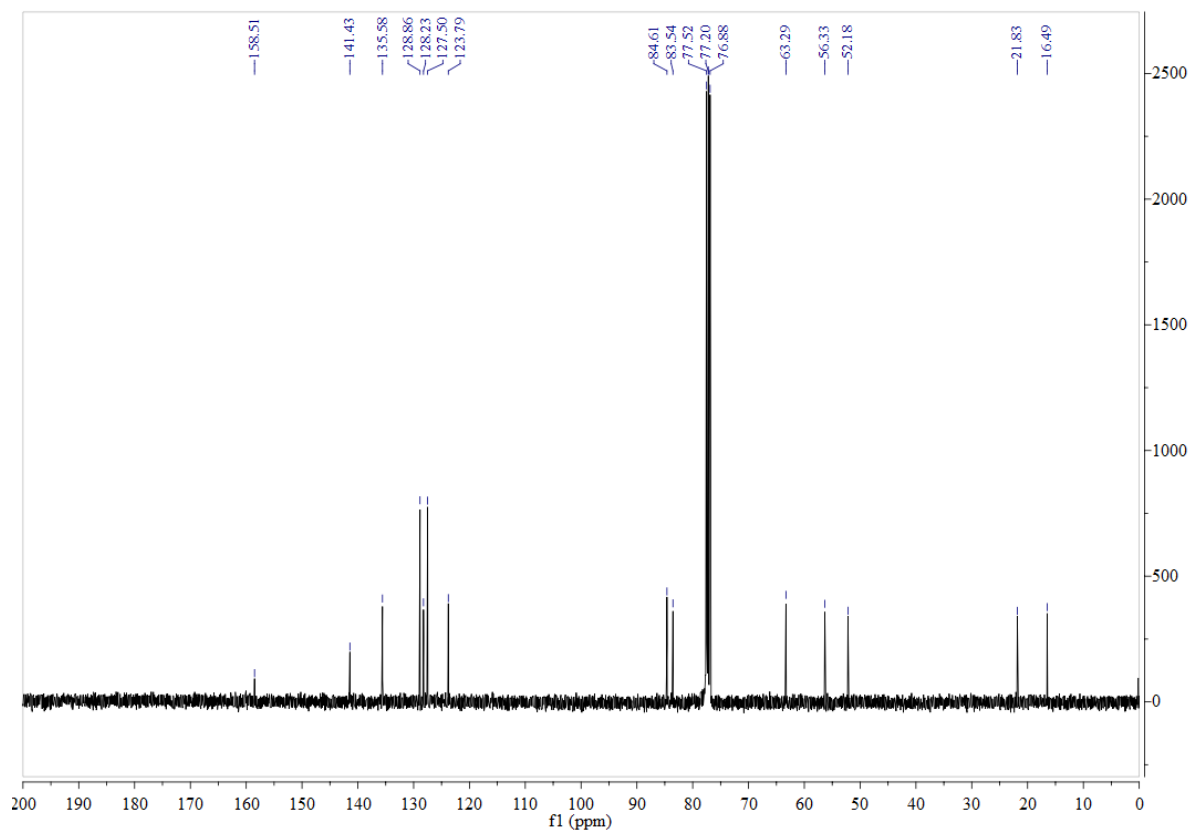
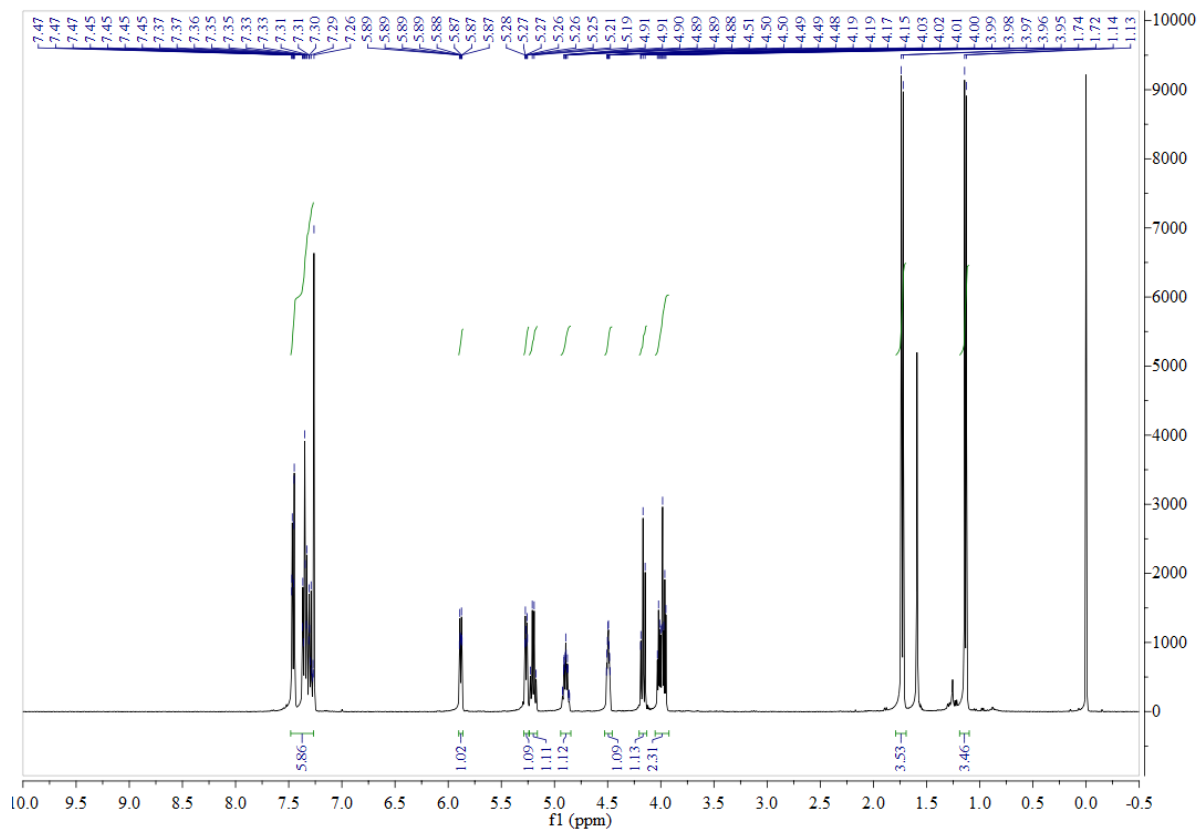
Synthesis of L-(+)-Furanomycin

(*R*)-2-((2*R*,5*S*)-5-Methyl-2,5-dihydrofuran-2-yl)-1-((*R*)-1-phenylethyl)aziridine (**4a**)



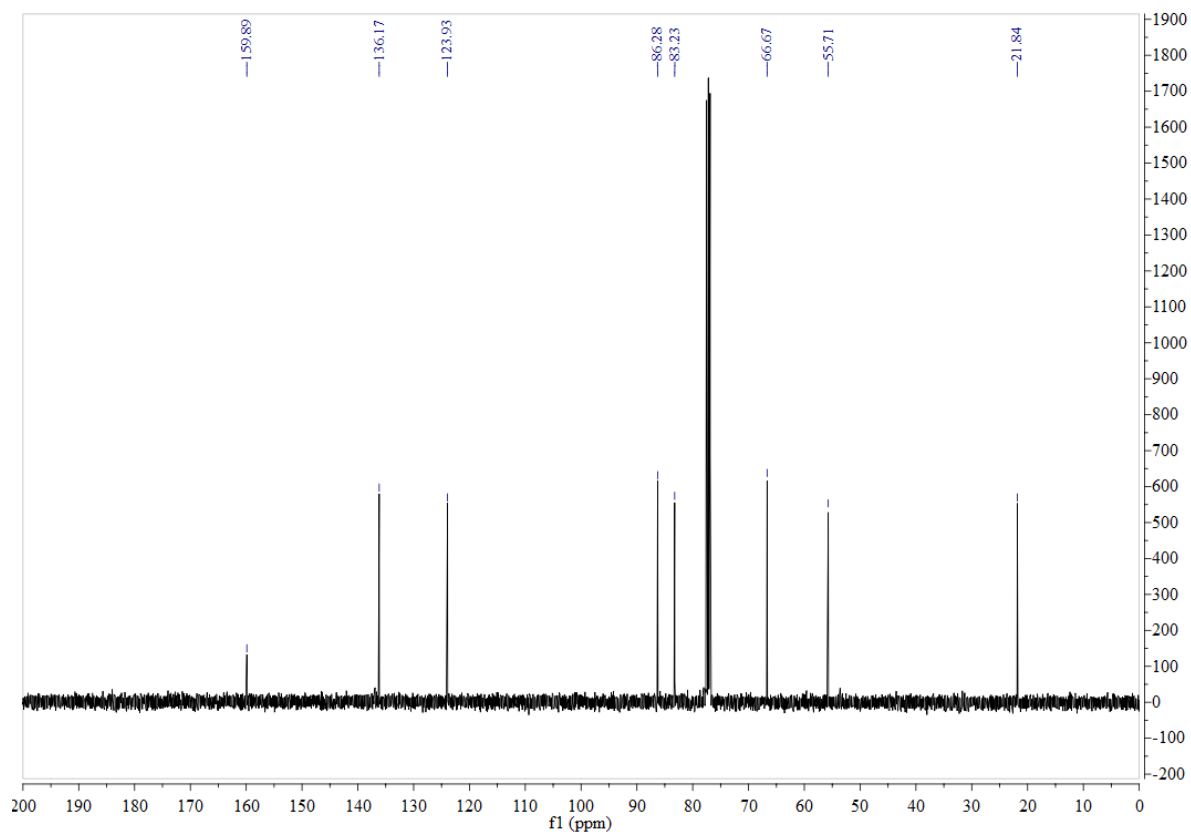
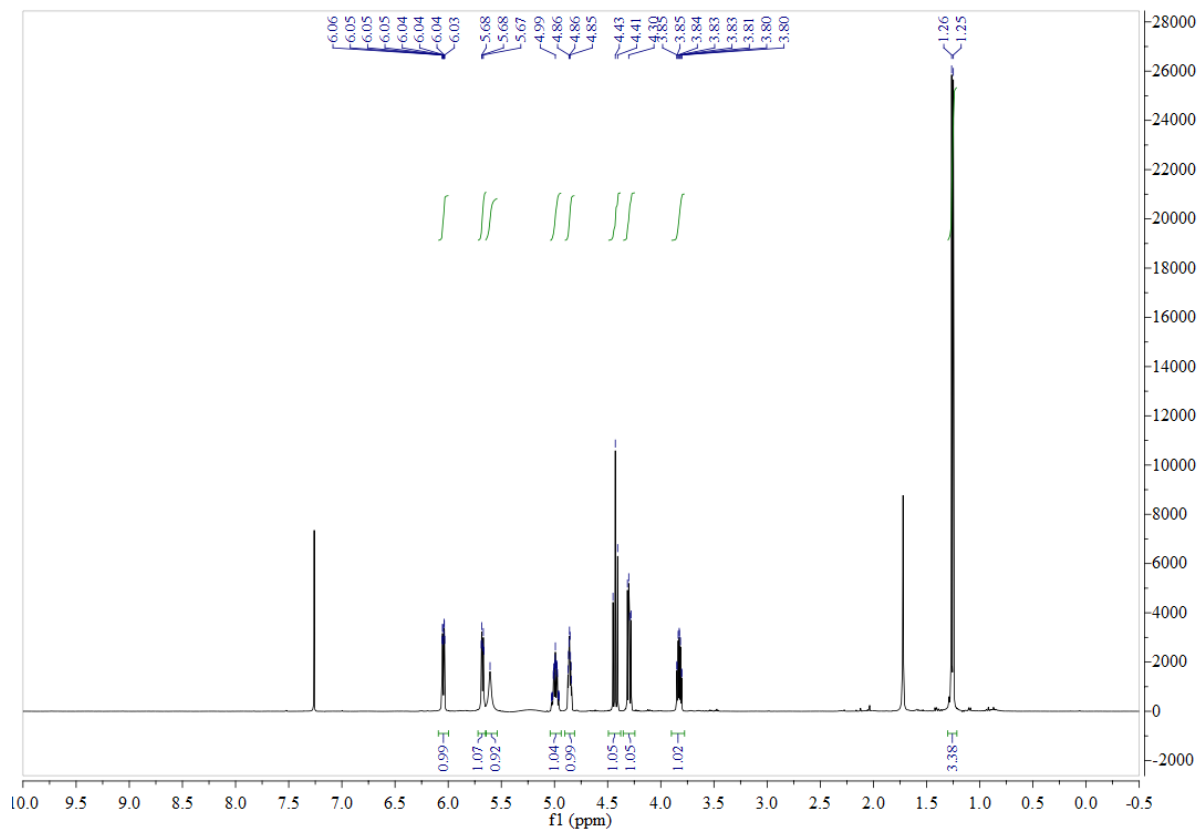
Synthesis of L-(+)-Furanomycin

(*R*)-4-((2*R*,5*S*)-5-Methyl-2,5-dihydrofuran-2-yl)-3-((*R*)-1-phenylethyl)oxazolidin-2-one (**5a**)



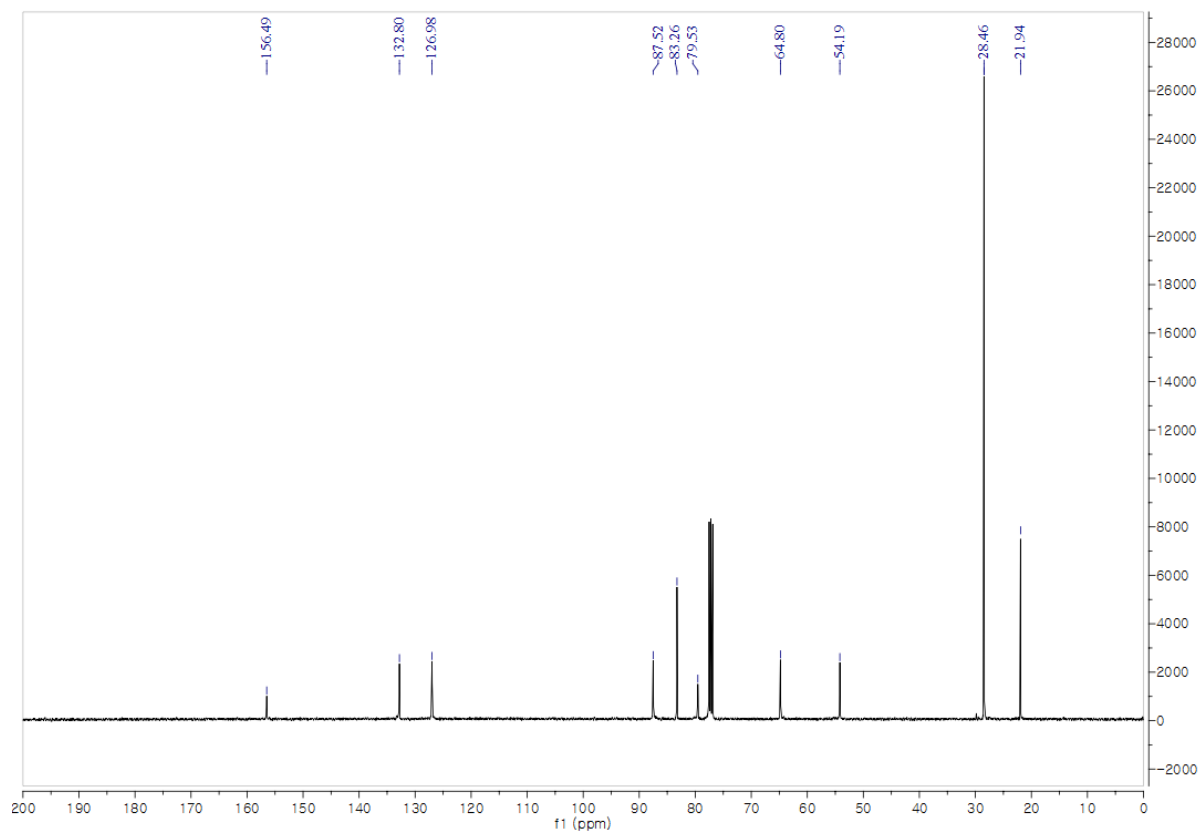
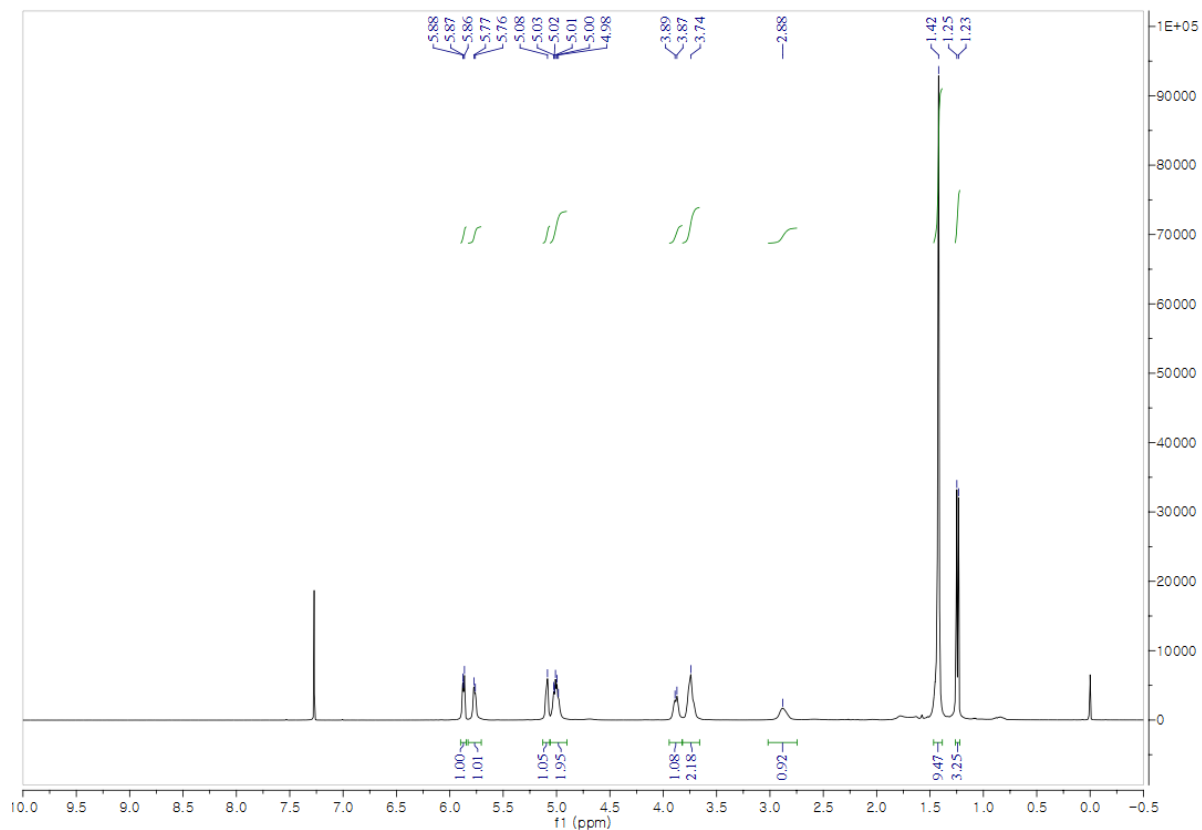
Synthesis of L-(+)-Furanomycin

(R)-4-((2R,5S)-5-Methyl-2,5-dihydrofuran-2-yl)oxazolidin-2-one (**6a**)



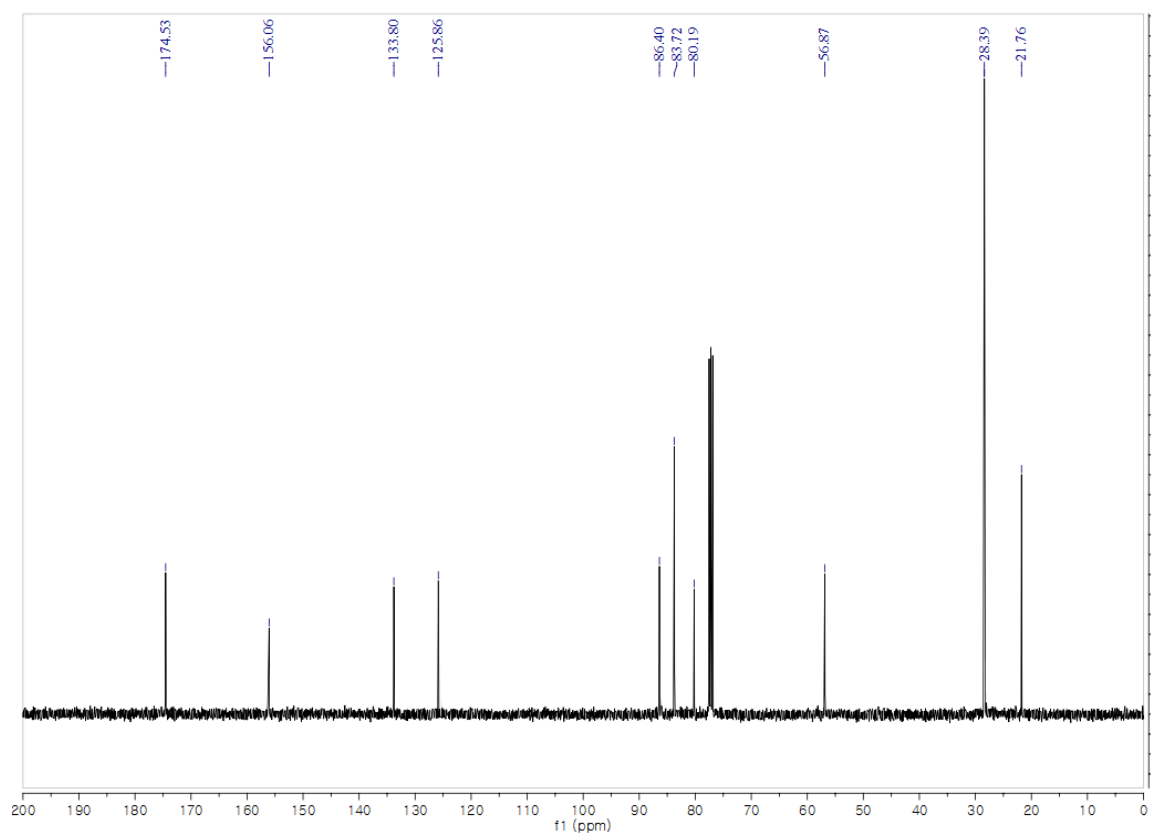
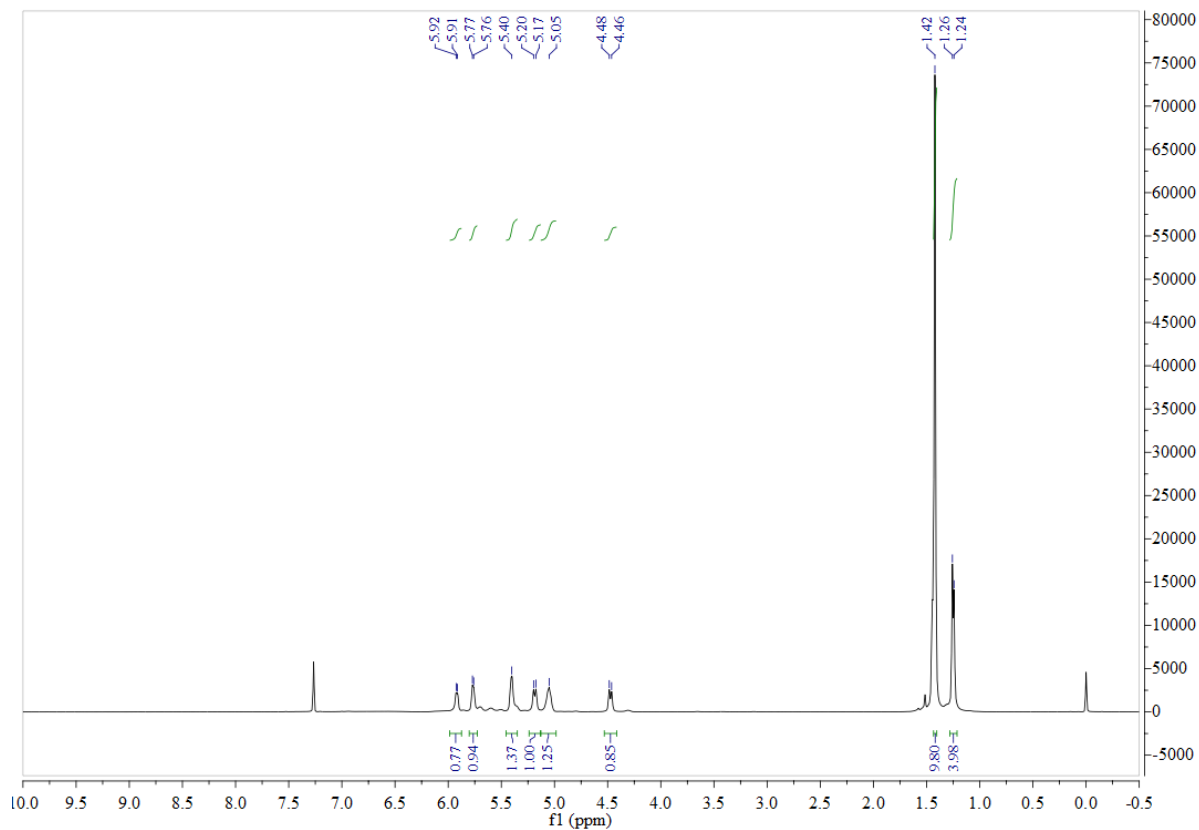
Synthesis of L-(+)-Furanomycin

tert-Butyl ((*R*)-2-hydroxy-1-((2*R*,5*S*)-5-methyl-2,5-dihydrofuran-2-yl)ethyl)carbamate (**7a**)



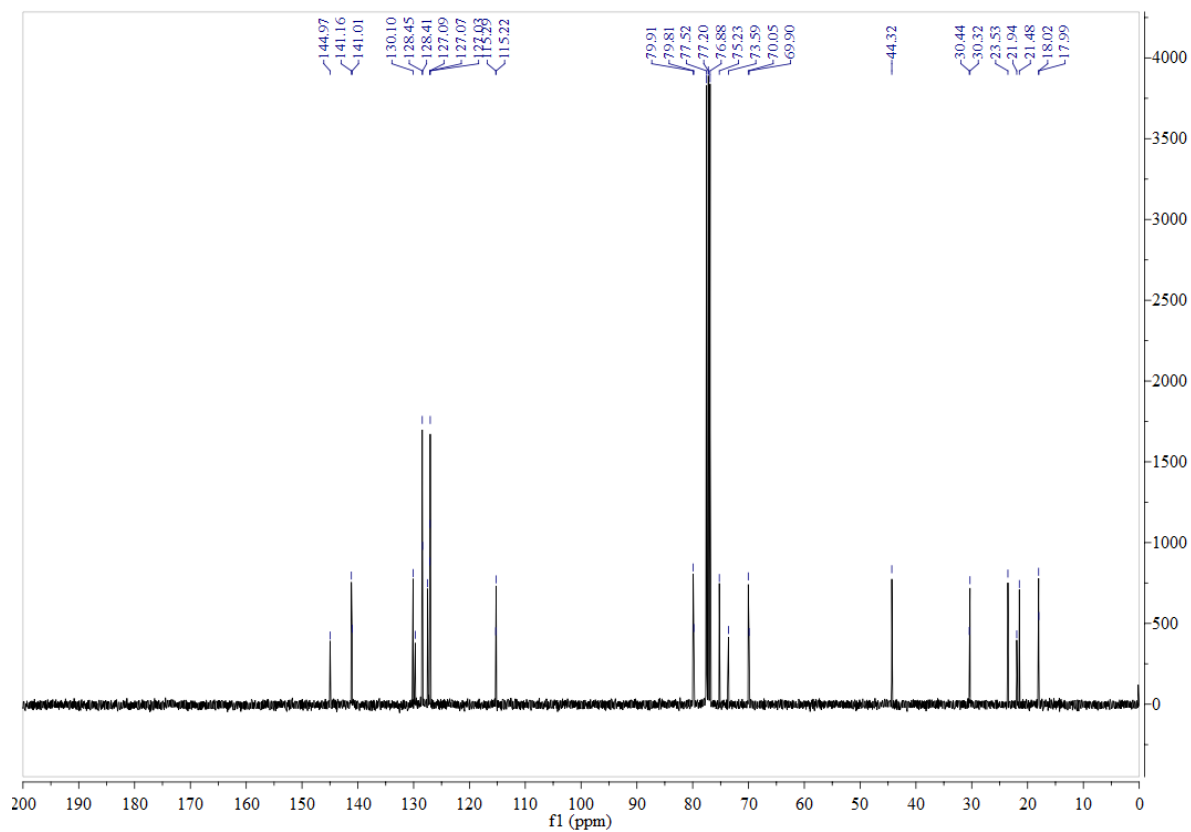
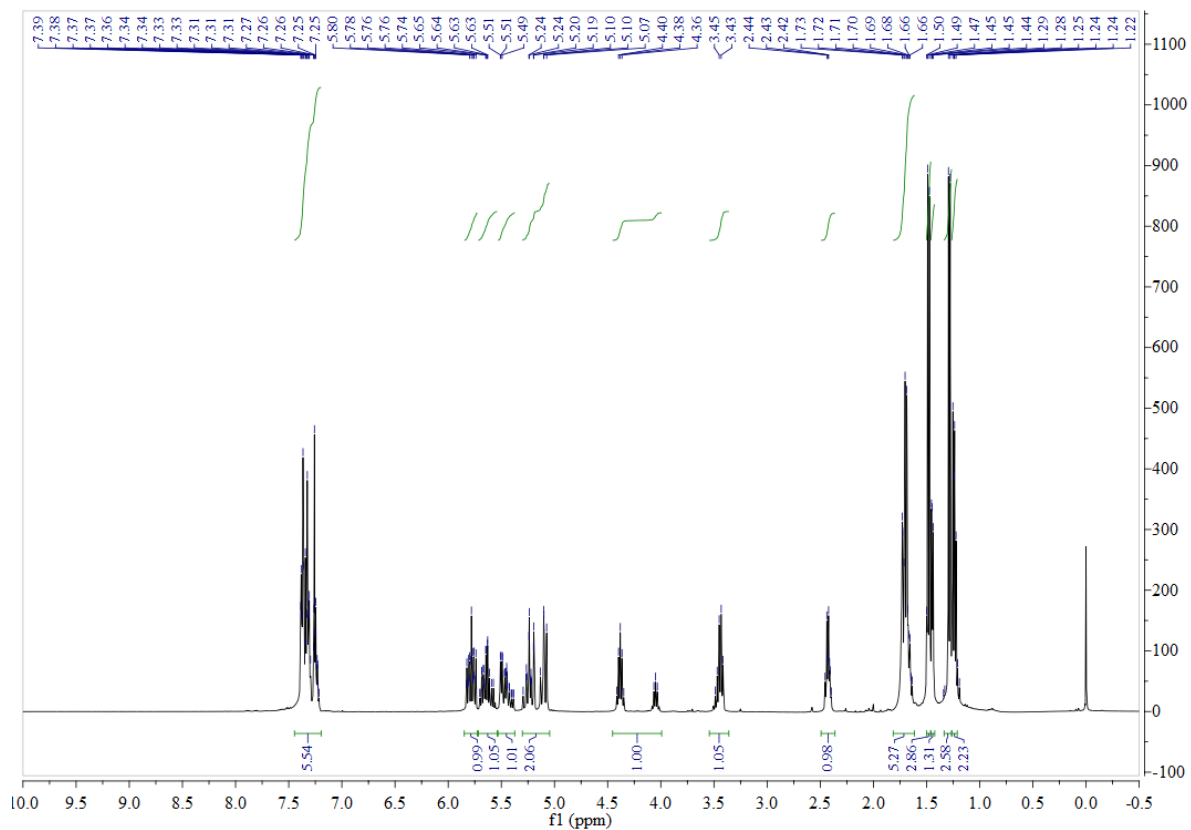
Synthesis of L-(+)-Furanomycin

(S)-2-((*tert*-Butoxycarbonyl)amino)-2-((2*R*,5*S*)-5-methyl-2,5-dihydrofuran-2-yl)acetic acid (**8a**)



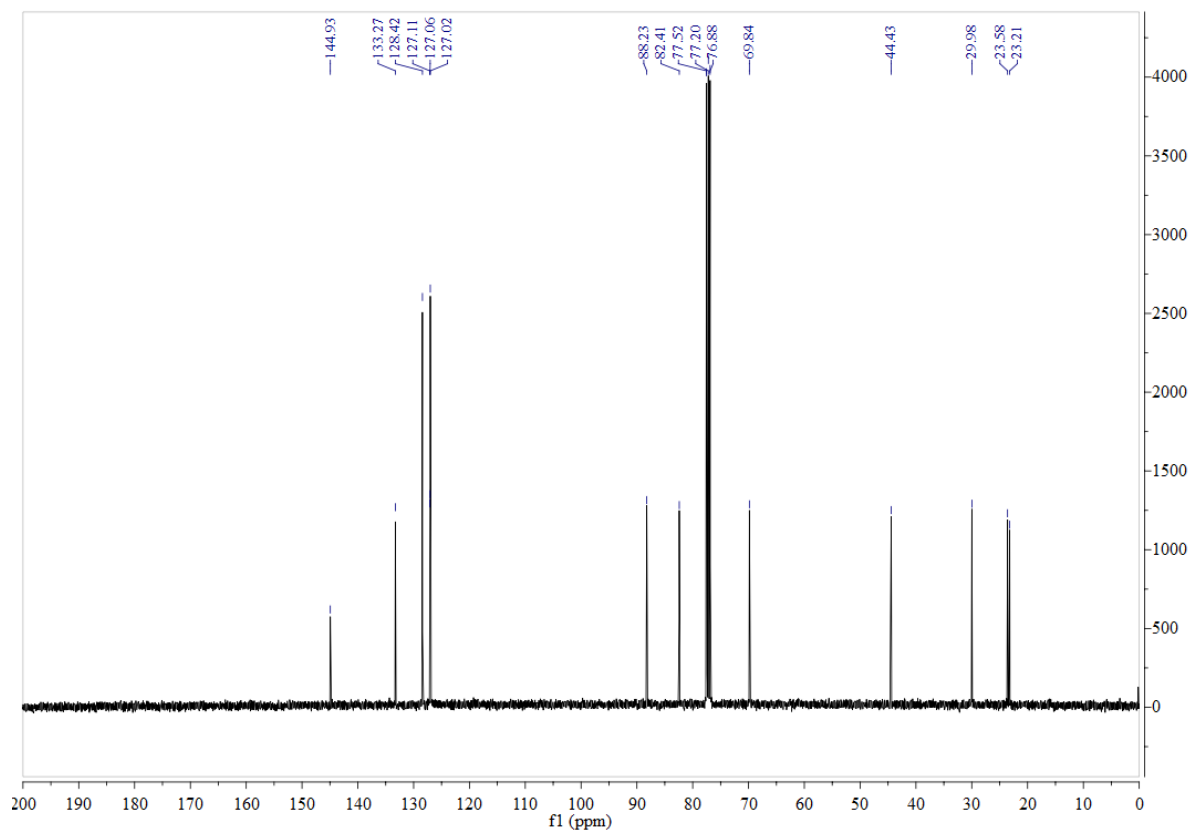
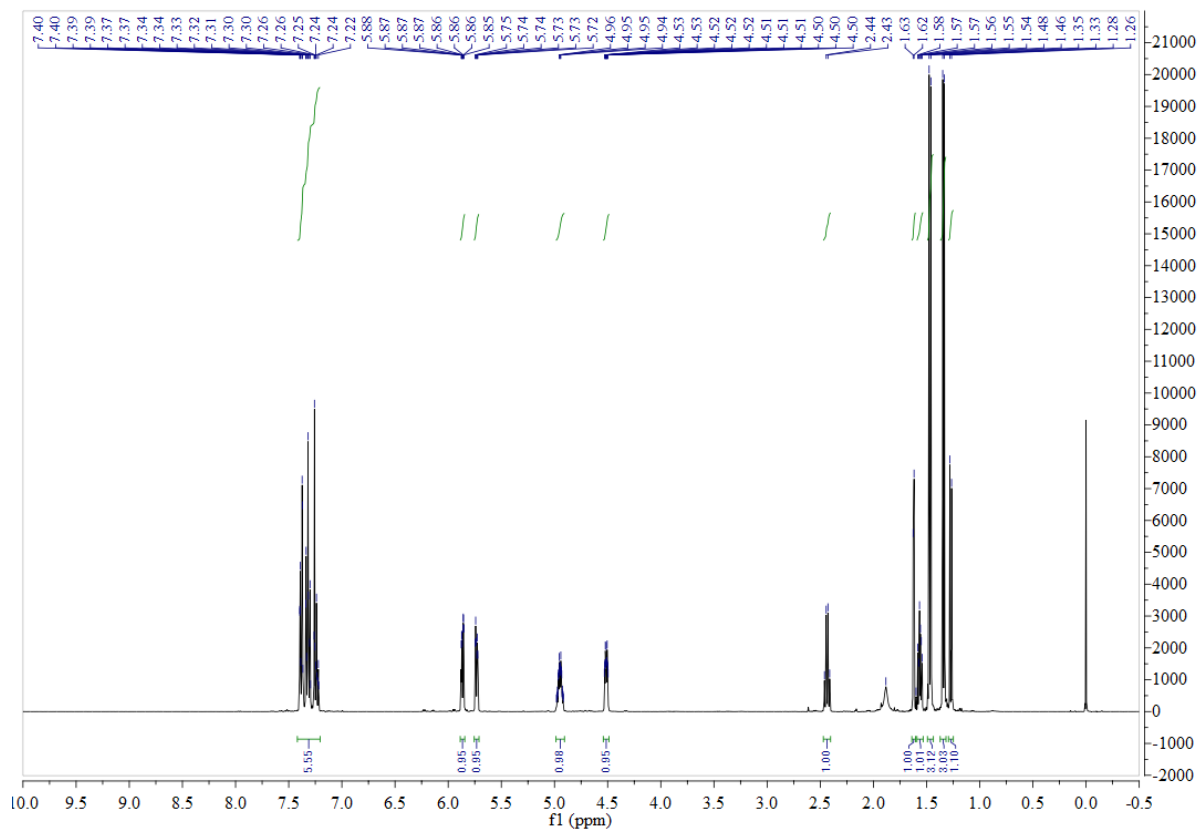
Synthesis of 5'-*epi*-furanomycin

(2*R*)-2-((1*R,E*)-1-((*R*)-But-3-en-2-yloxy)but-2-en-1-yl)-1-((*R*)-1-phenylethyl)aziridine (**3b**)



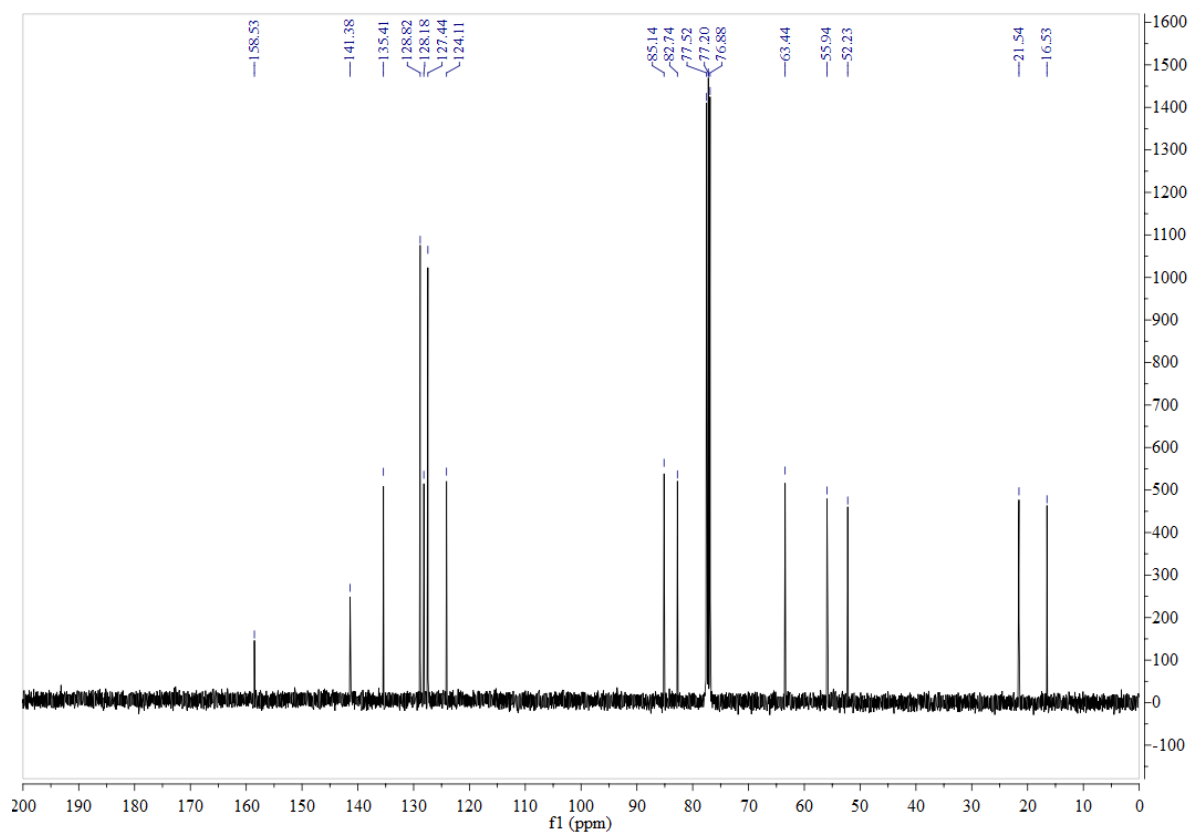
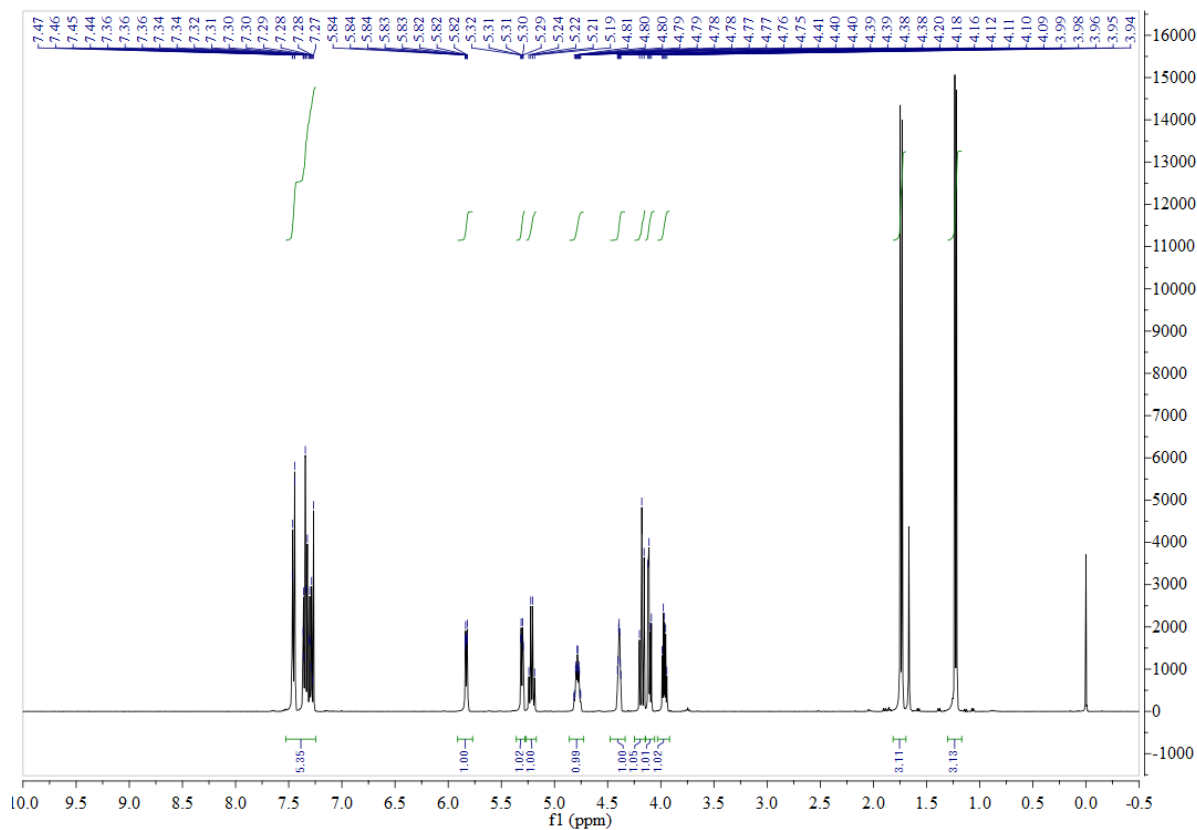
Synthesis of 5'-*epi*-furanomycin

(*R*)-2-((2*R*,5*R*)-5-Methyl-2,5-dihydrofuran-2-yl)-1-((*R*)-1-phenylethyl)aziridine (**4b**)



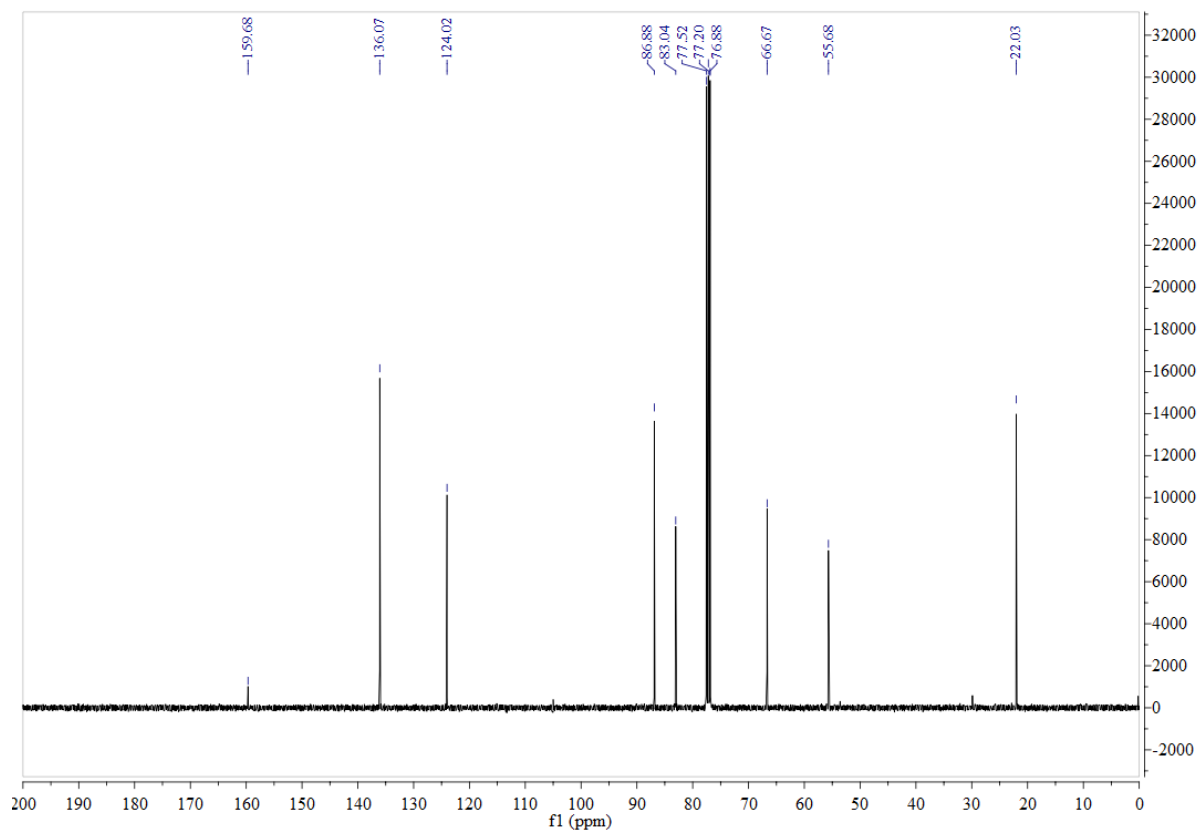
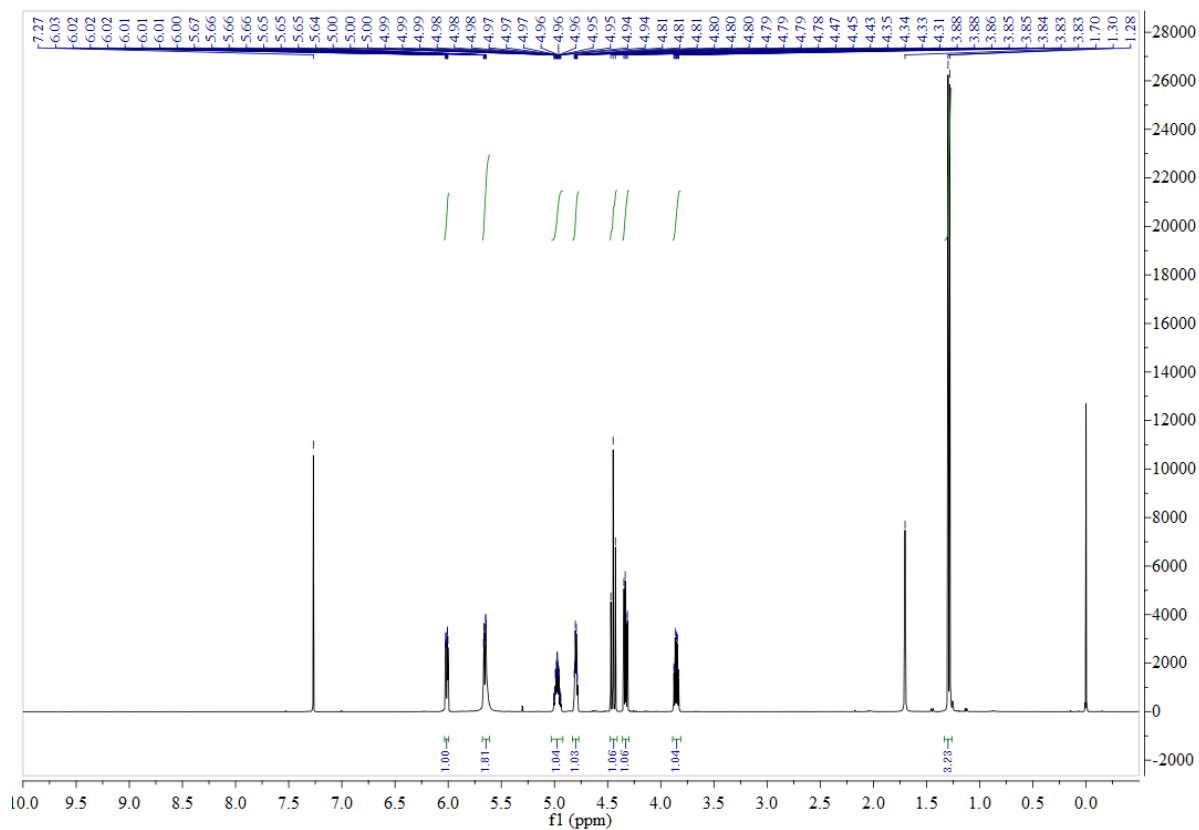
Synthesis of 5'-*epi*-furanomycin

(*R*)-4-((2*R*,5*R*)-5-Methyl-2,5-dihydrofuran-2-yl)-3-((*R*)-1-phenylethyl)oxazolidin-2-one (**5b**)



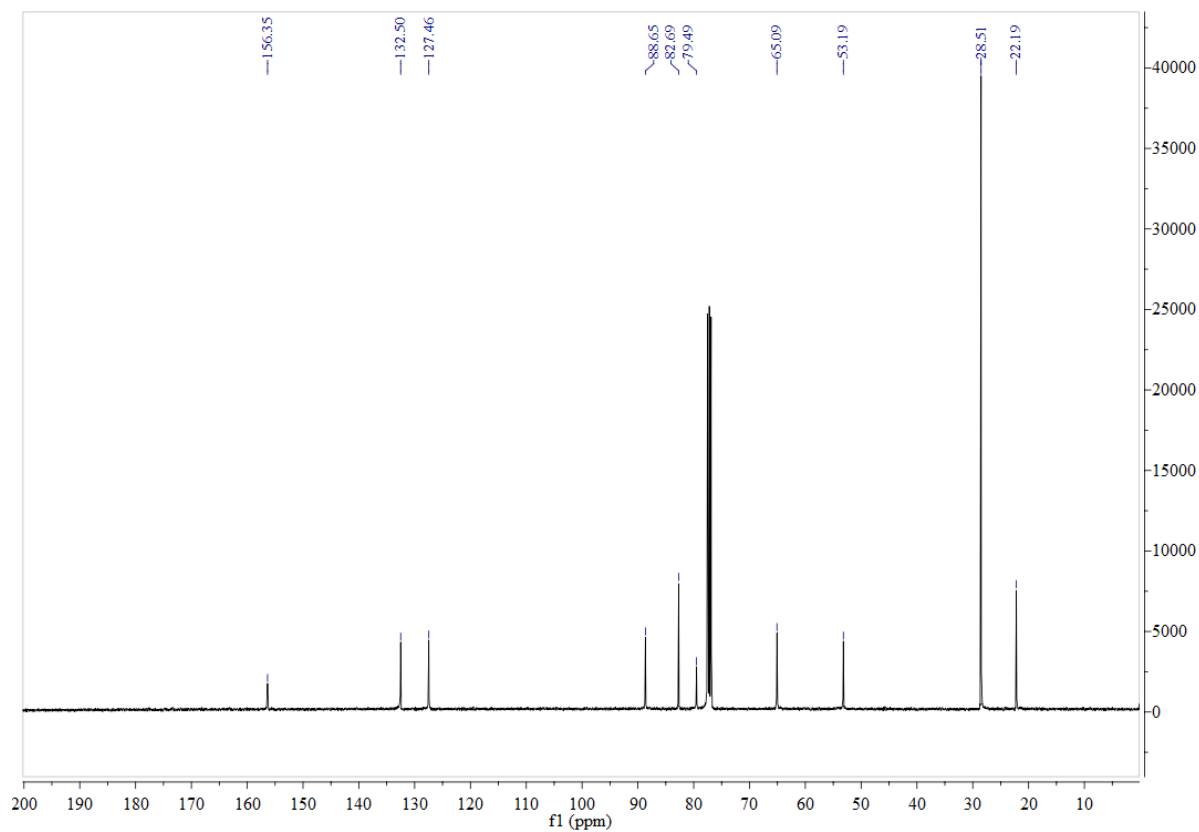
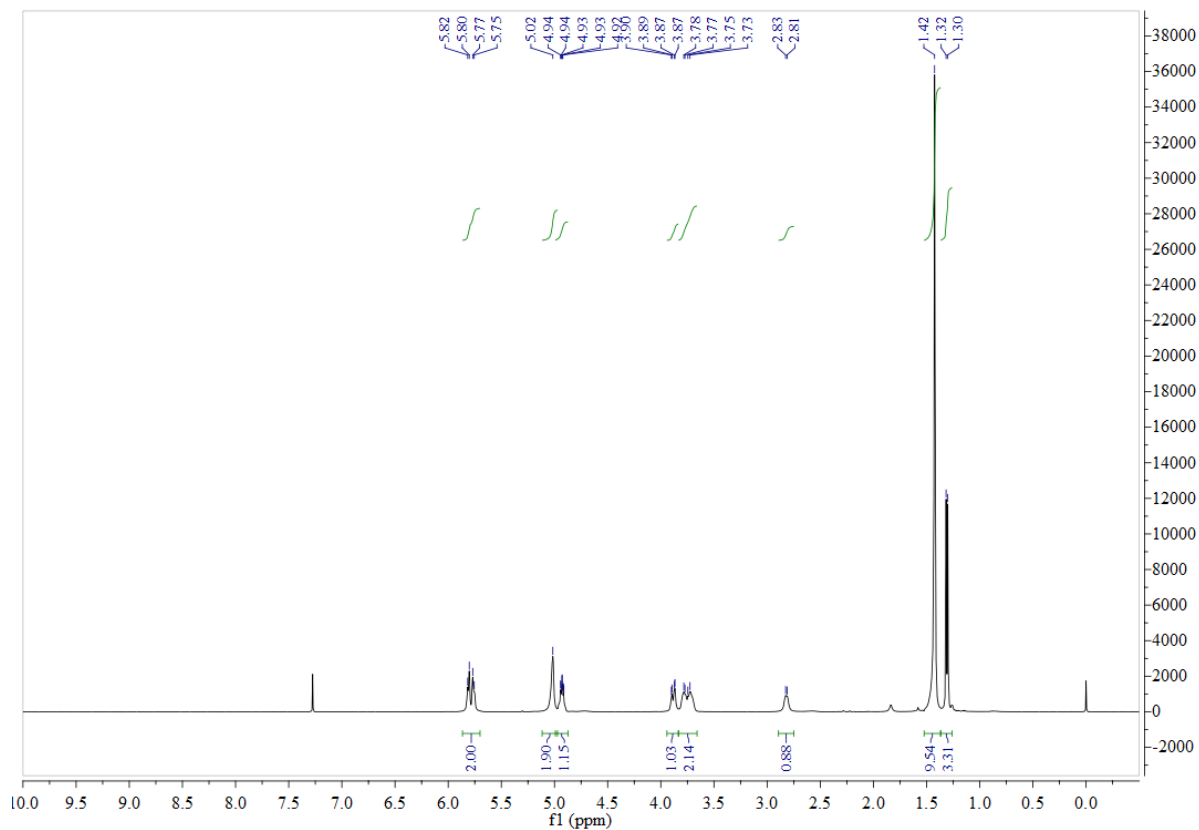
Synthesis of 5'-*epi*-furanomycin

(*R*)-4-((2*R*,5*R*)-5-Methyl-2,5-dihydrofuran-2-yl)oxazolidin-2-one (**6b**)



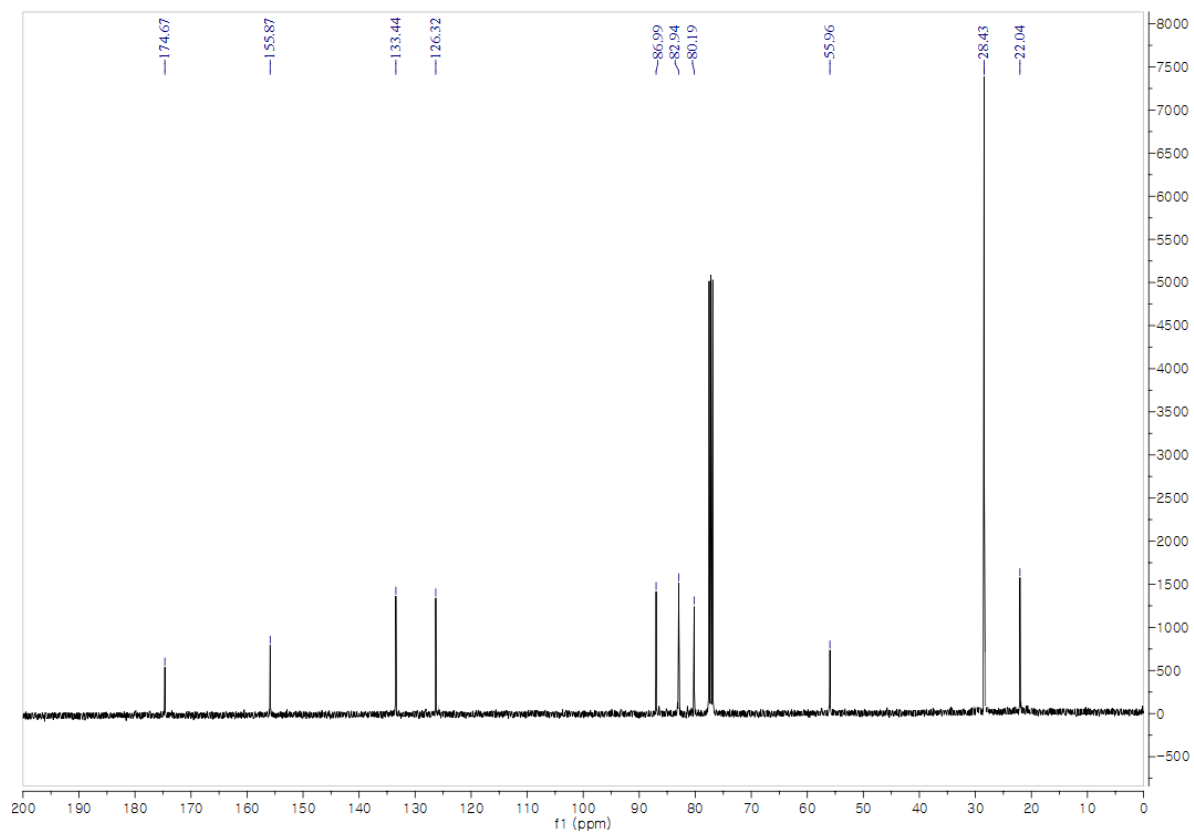
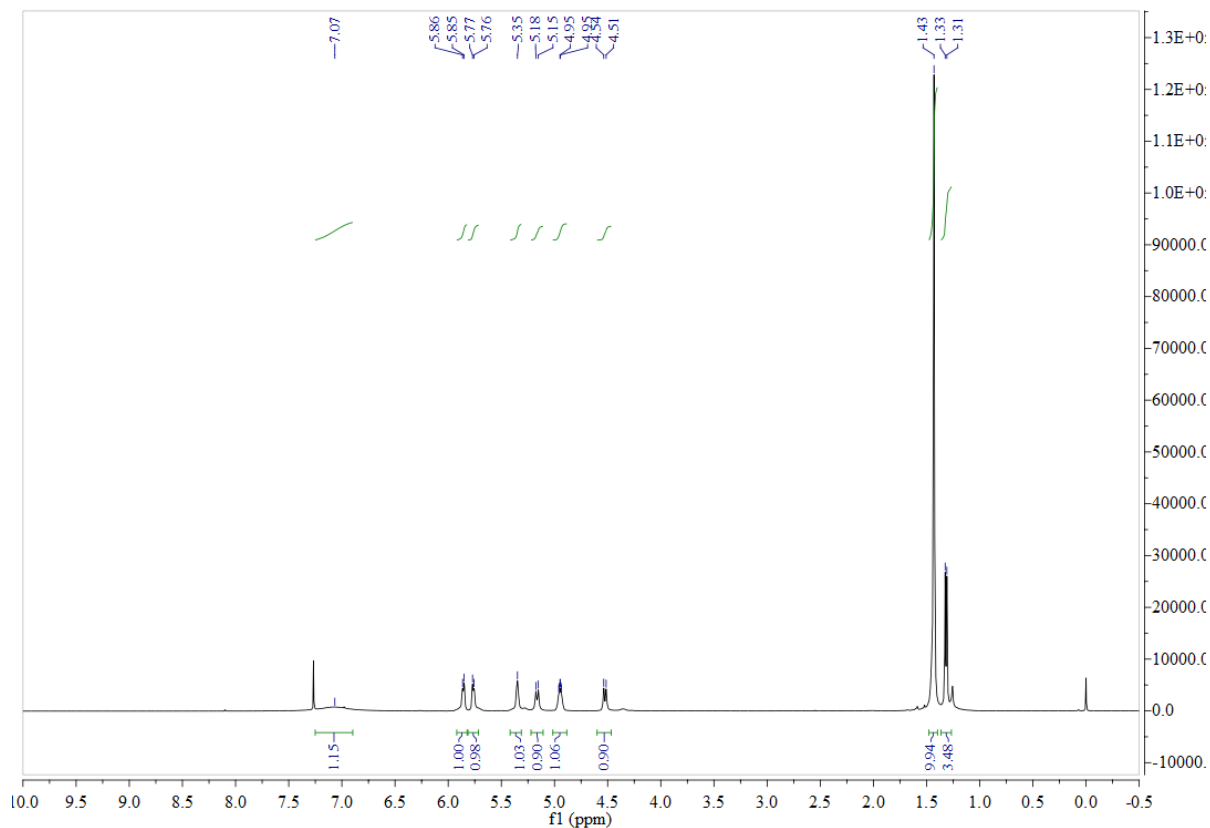
Synthesis of 5'-*epi*-furanomycin

tert-Butyl ((*R*)-2-hydroxy-1-((2*R*,5*R*)-5-methyl-2,5-dihydrofuran-2-yl)ethyl)carbamate (**7b**)



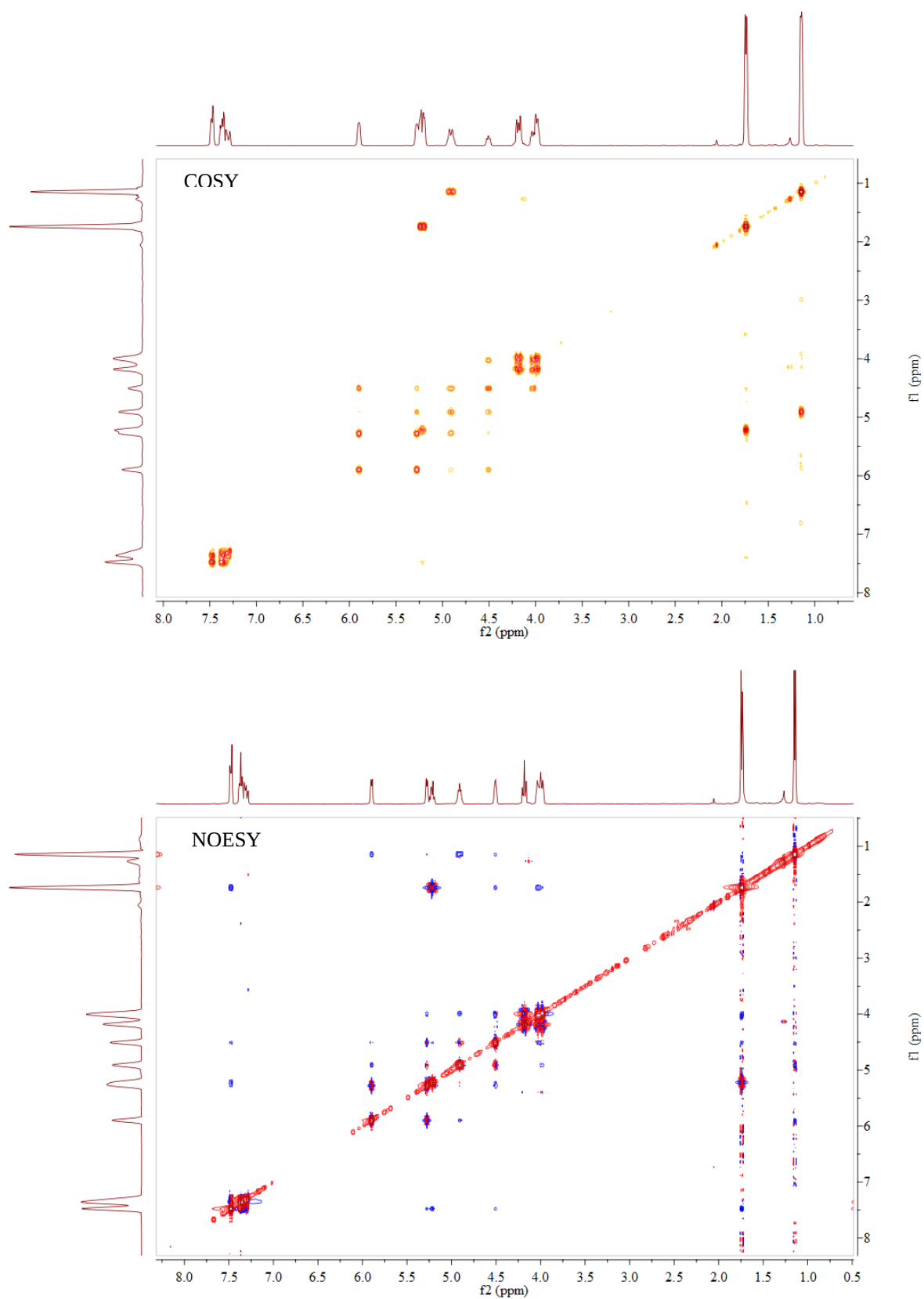
Synthesis of 5'-*epi*-furanomycin

(*S*)-2-((*tert*-Butoxycarbonyl)amino)-2-((2*R*,5*R*)-5-methyl-2,5-dihydrofuran-2-yl)acetic acid (**8b**)



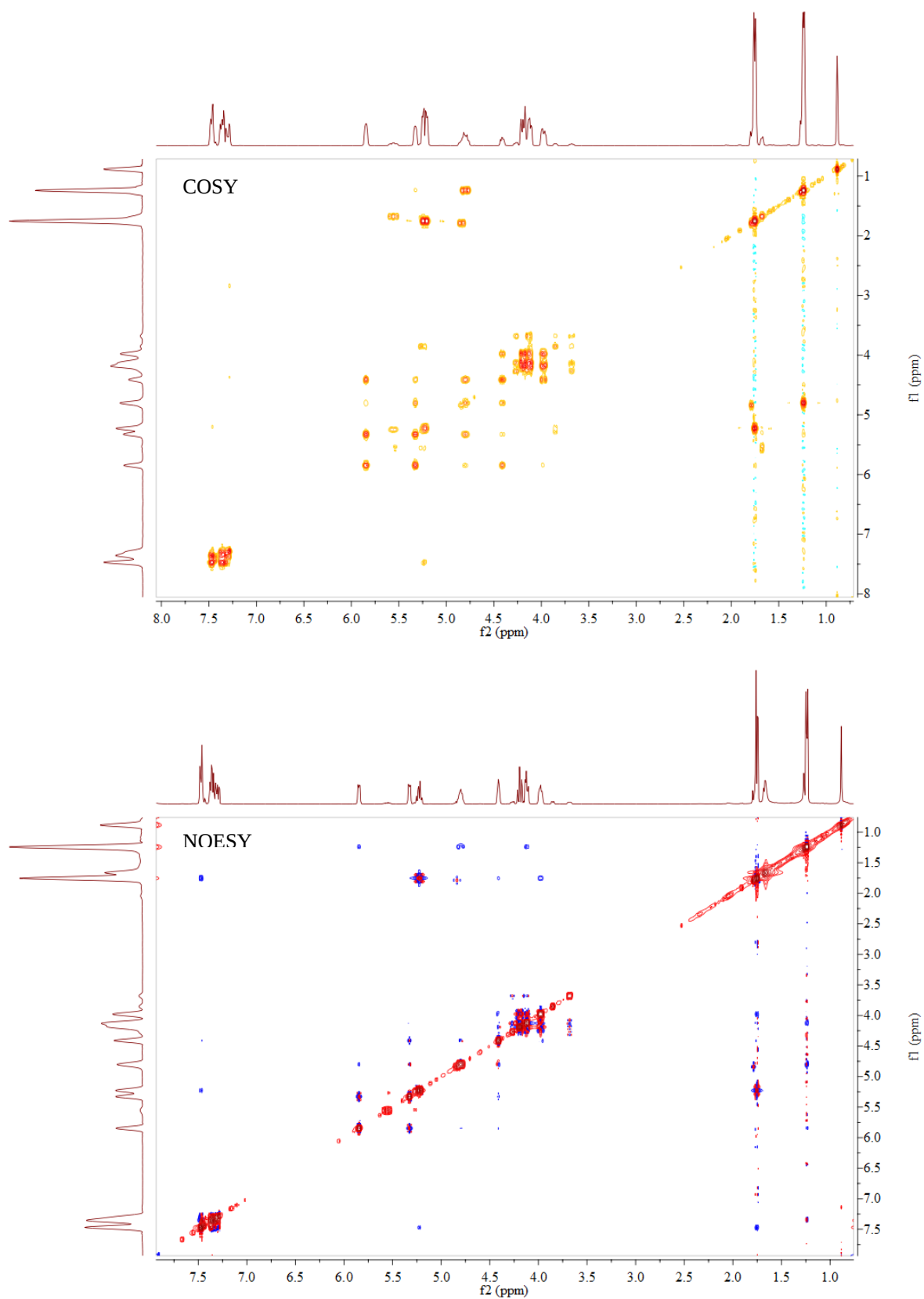
Stereochemistry identification (5a and 5b) -2D NMR spectra (COSY, NOE)

(*R*)-4-((2*R*,5*S*)-5-Methyl-2,5-dihydrofuran-2-yl)-3-((*R*)-1-phenylethyl)oxazolidin-2-one (5a)



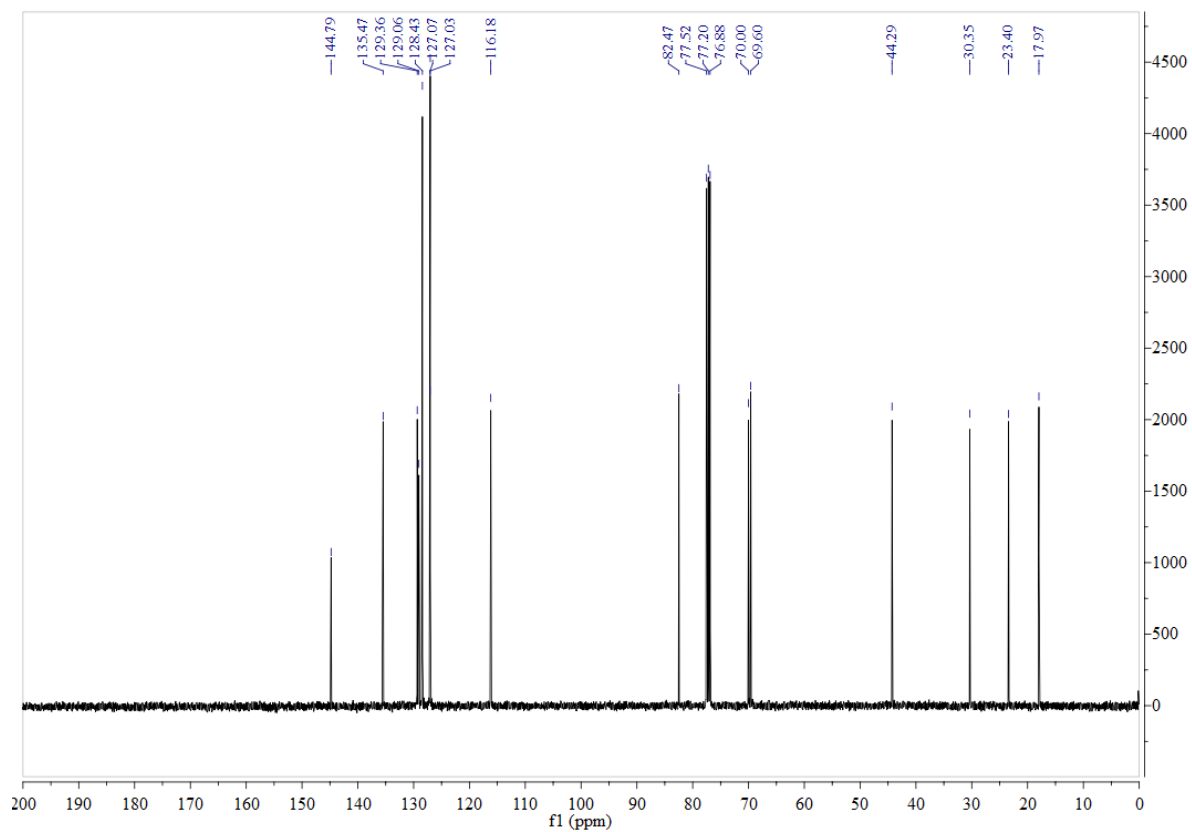
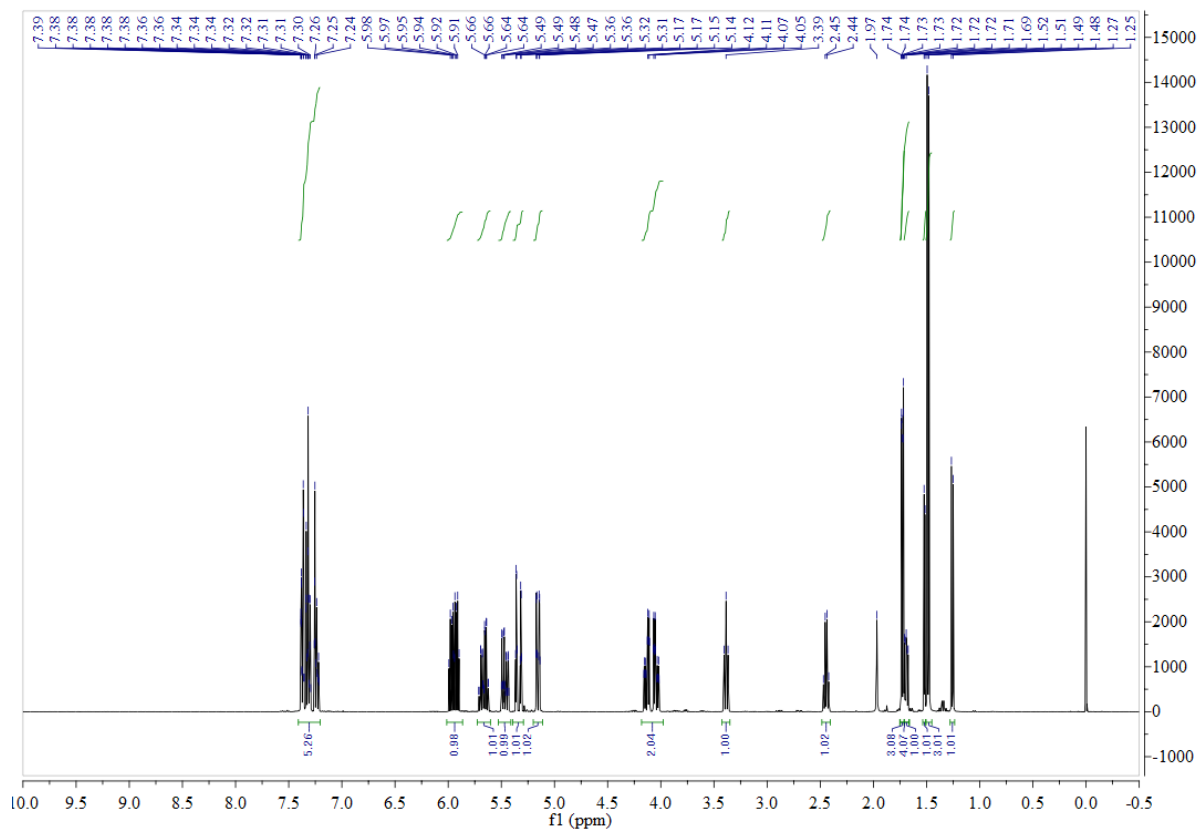
COSY and NOESY spectra of 5a and 5b

(*R*)-4-((2*R*,5*R*)-5-Methyl-2,5-dihydrofuran-2-yl)-3-((*R*)-1-phenylethyl)oxazolidin-2-one (**5b**)

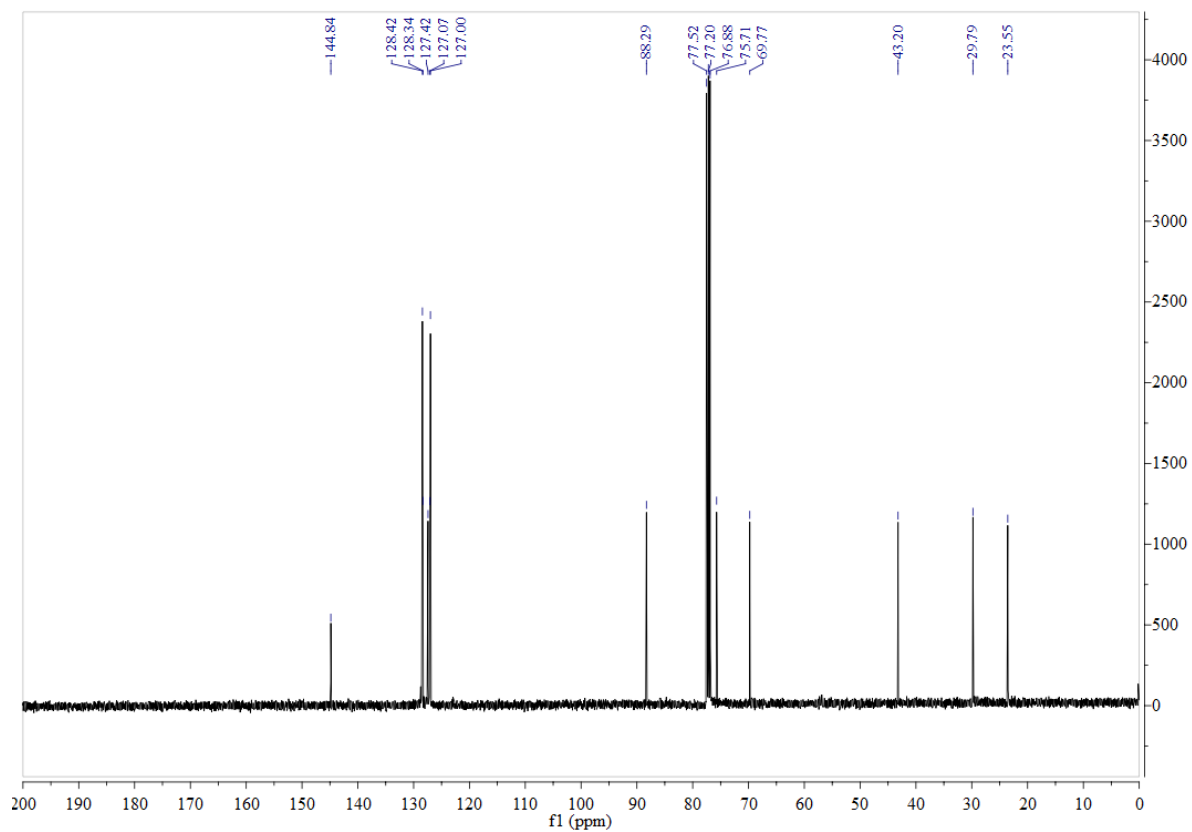


Synthesis of Norfuranomycin

(*R*)-2-((*R,E*)-1-(Allyloxy)but-2-enyl)-1-((*R*)-1-phenylethyl)aziridine (**3c**)

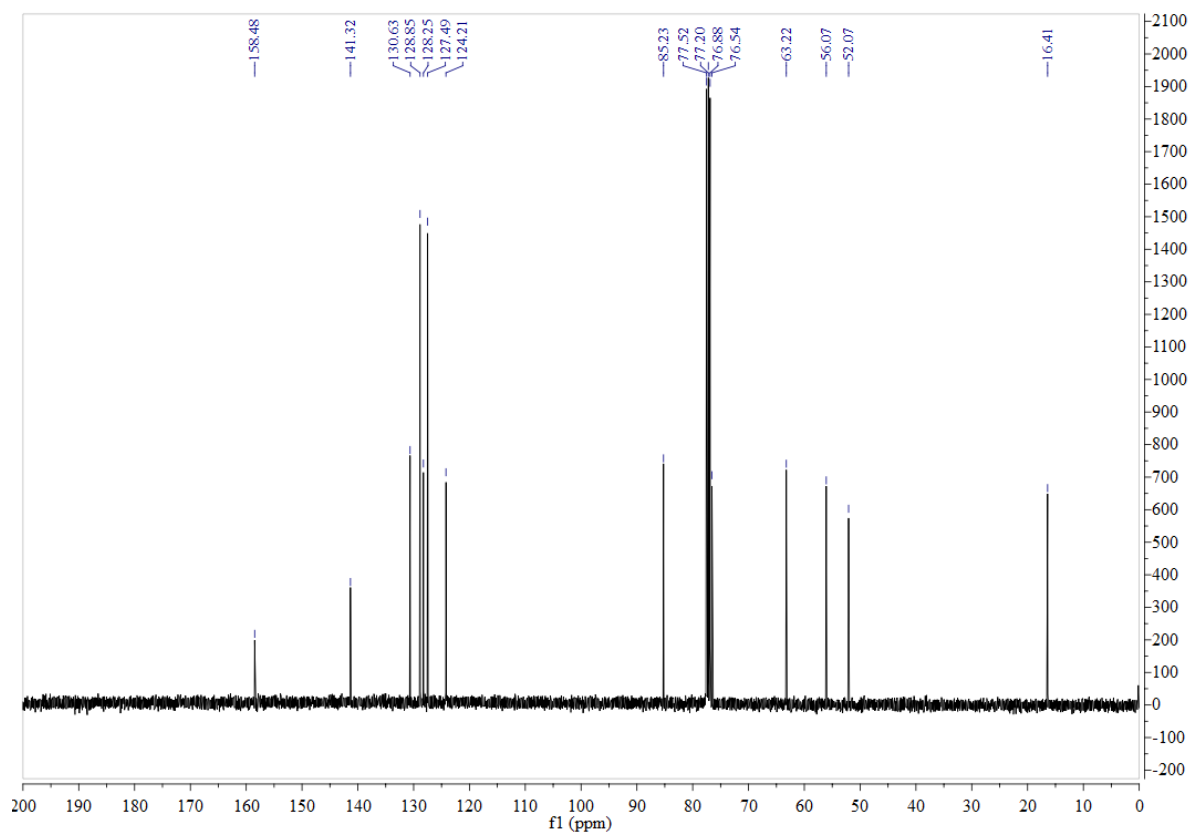
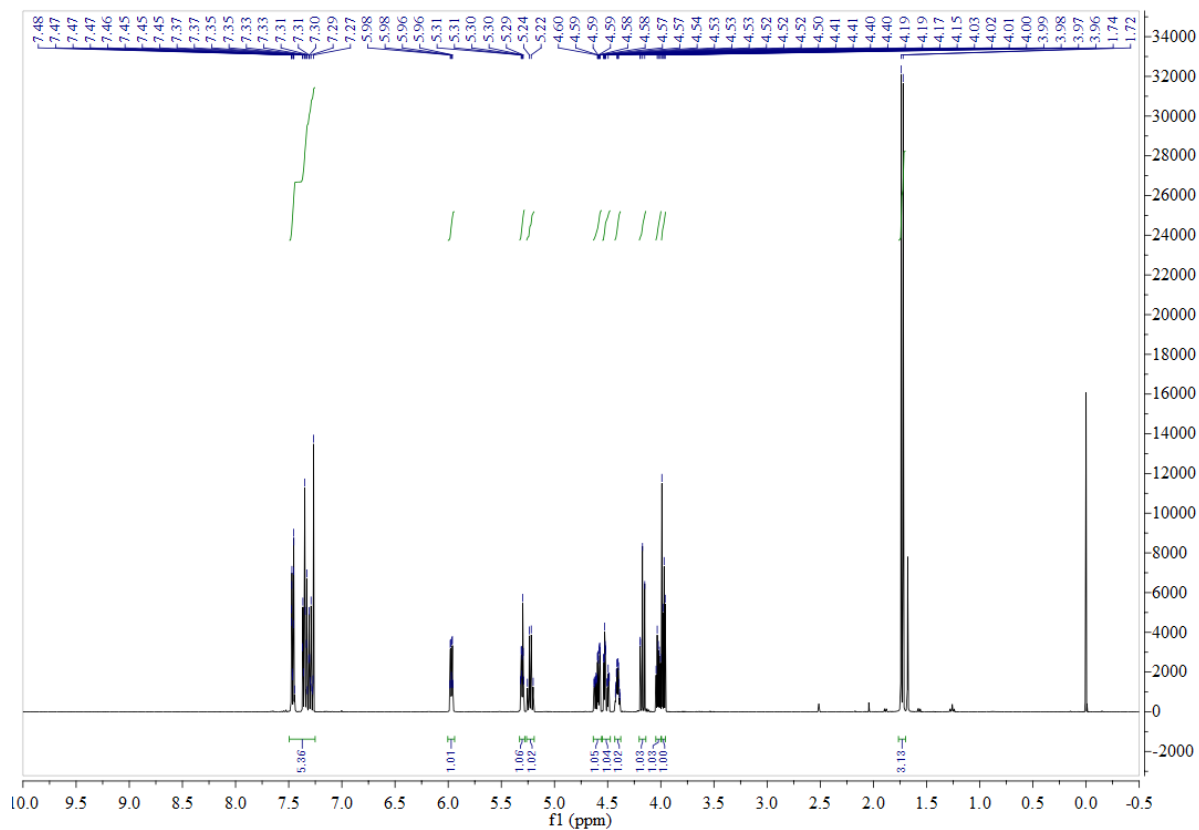


(*R*)-2-((*R*)-2,5-Dihydrofuran-2-yl)-1-((*R*)-1-phenylethyl)aziridine (**4c**)

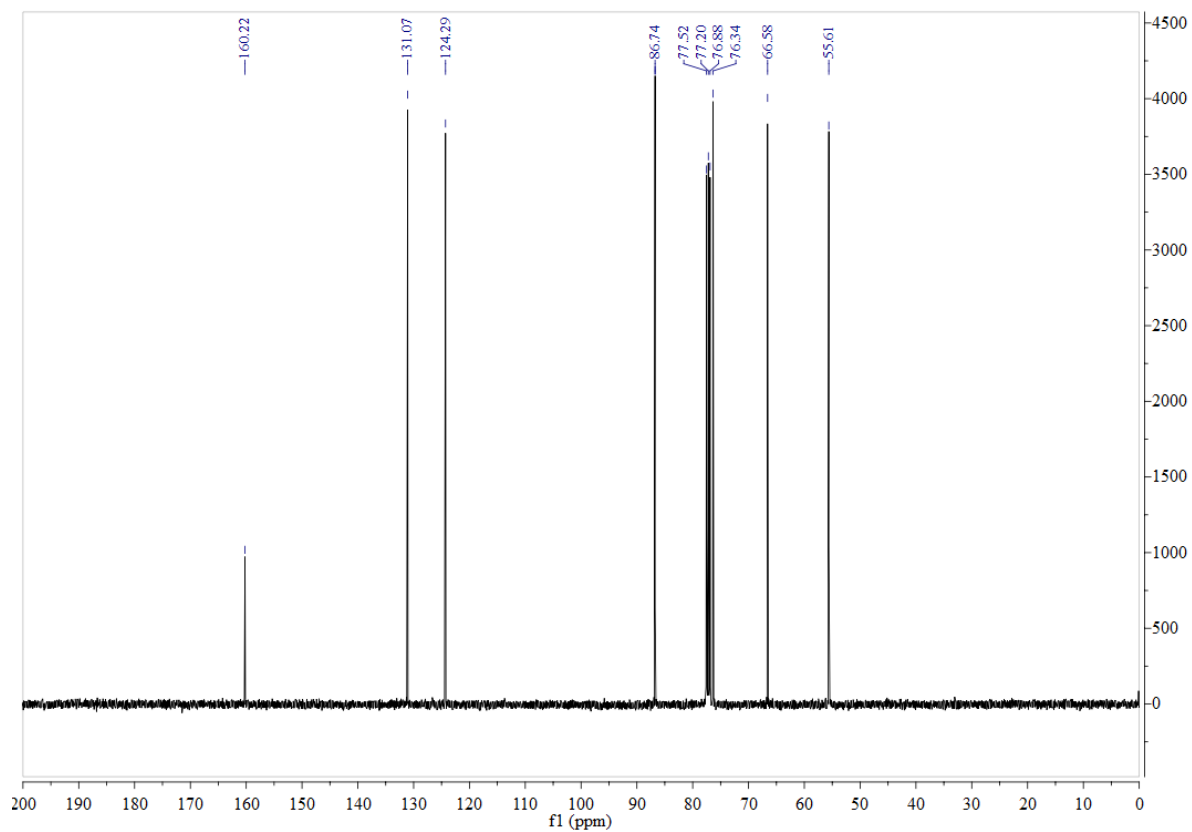


Synthesis of Norfuranomycin

(*R*)-4-((*R*)-2,5-Dihydrofuran-2-yl)-3-((*R*)-1-phenylethyl)oxazolidin-2-one (5c)

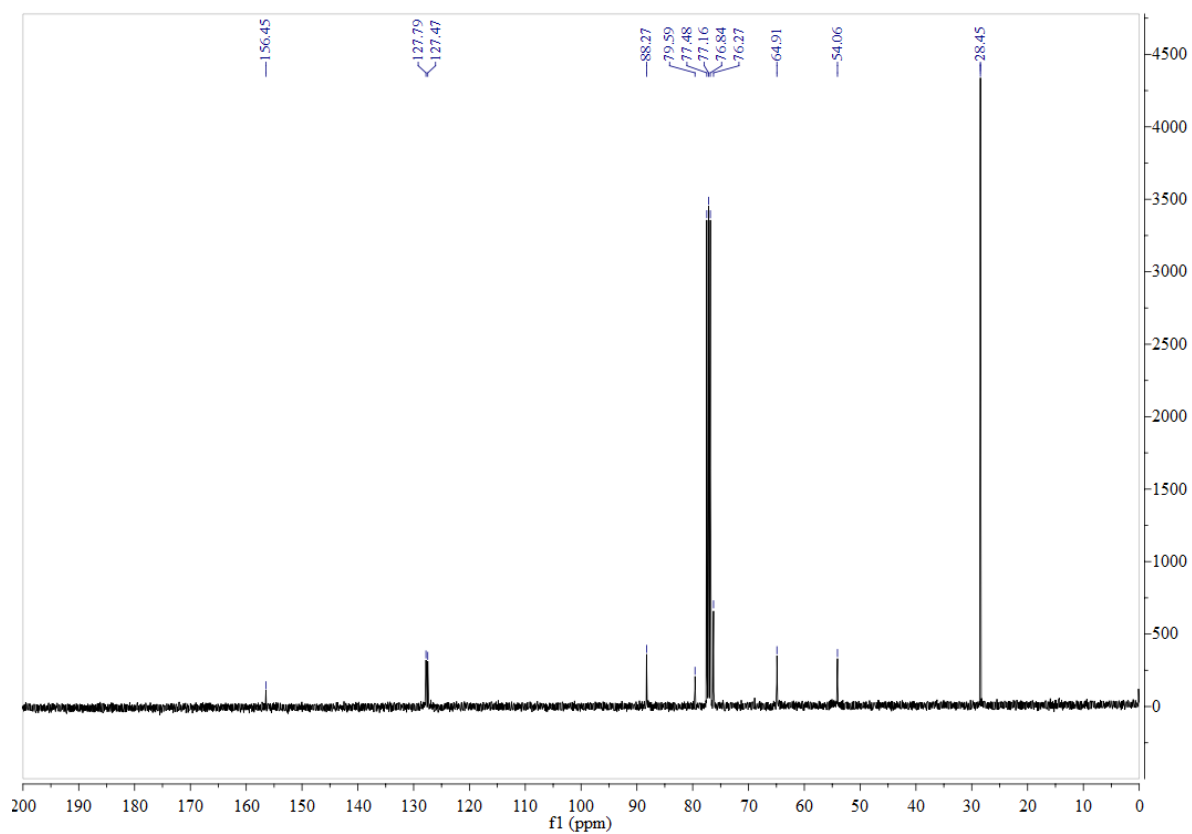
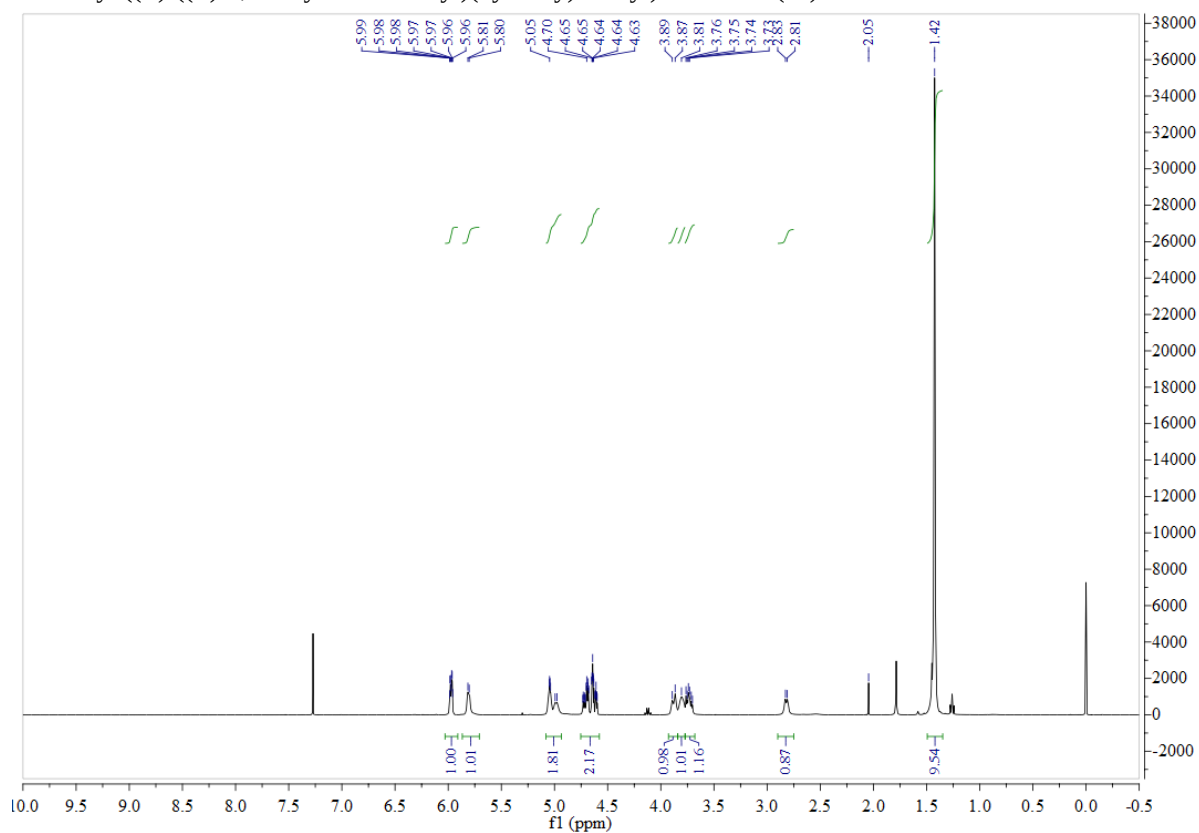


(R)-4-((R)-2,5-Dihydrofuran-2-yl)oxazolidin-2-one (**6c**)



Synthesis of Norfuranomycin

tert-Butyl ((*R*)-((*R*)-2,5-dihydrofuran-2-yl)(hydroxy)methyl)carbamate (**7c**)



Synthesis of Norfuranomycin

(S)-2-((*tert*-Butoxycarbonyl)amino)-2-((*R*)-2,5-dihydrofuran-2-yl)acetic acid (**8c**)

