

Novel Adamantyl clubbed Iminothiozolidinones as promising Elastase Inhibitors: Design, Synthesis, Molecular Docking, ADMET and DFT Studies

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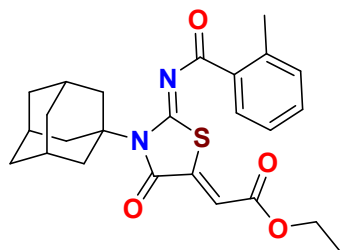
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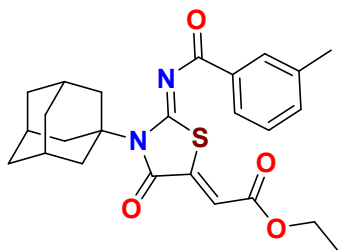
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REFERENCES

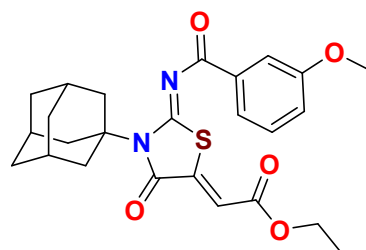
THE STRUCTURES OF THE FINAL COMPOUNDS



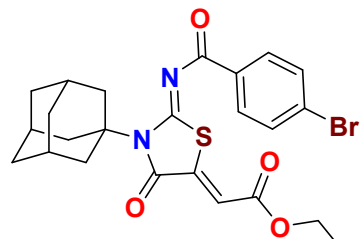
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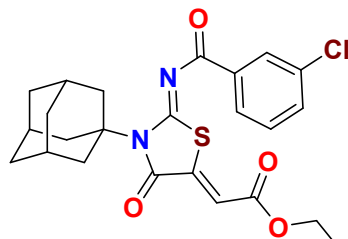
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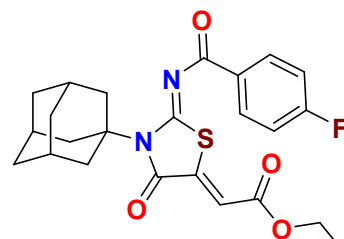
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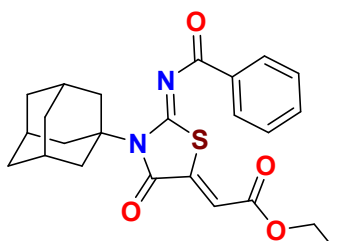
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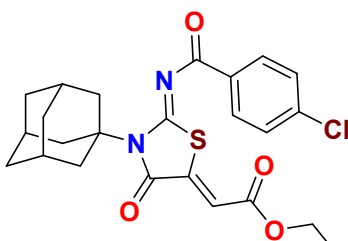
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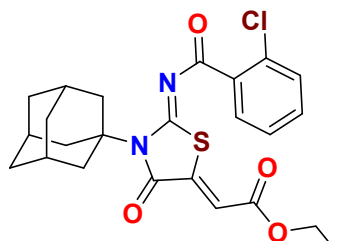
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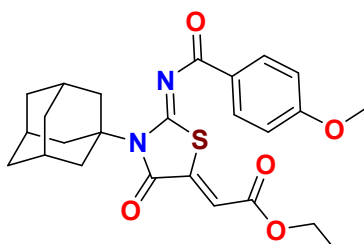
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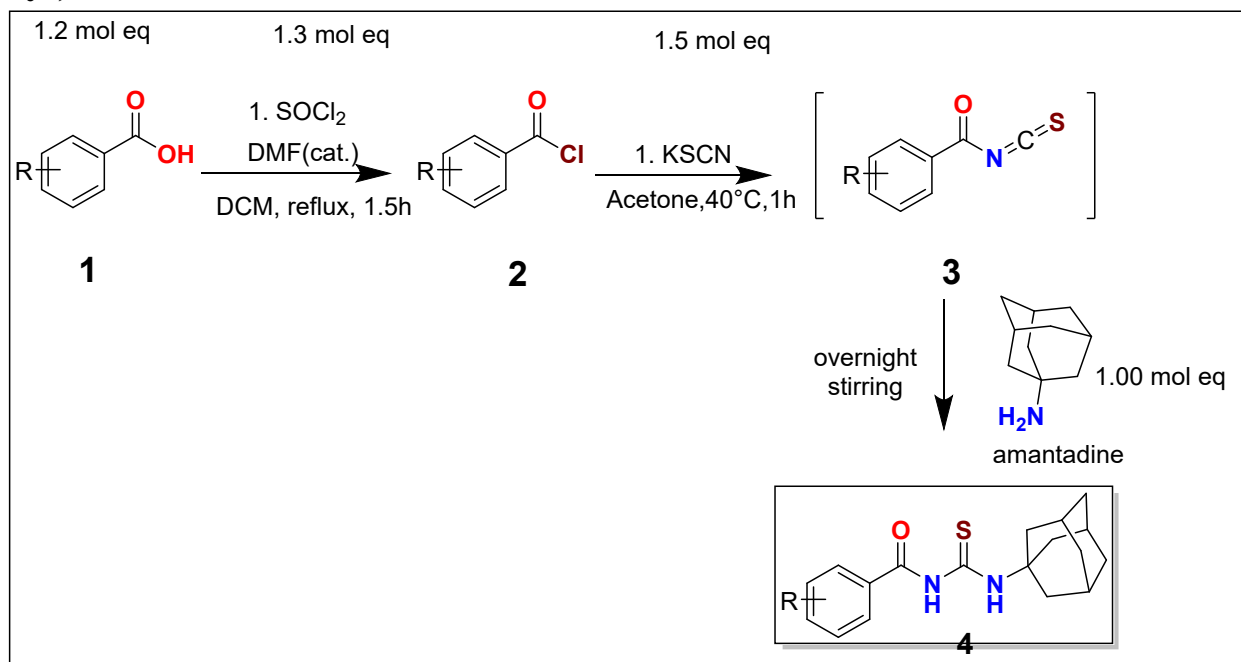
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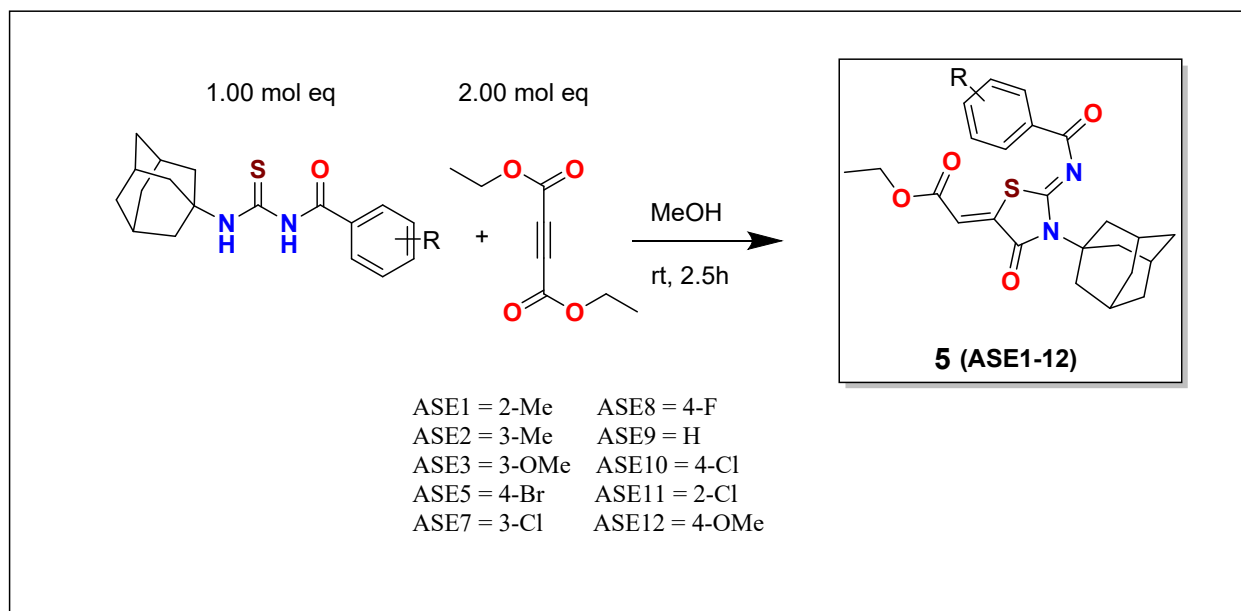
SYNTHETIC PATHWAYS

Synthetic pathway to N-(((1s,3s)-adamantane-1-yl)carbamothioyl)benzamide



Substituted aryl carboxylic acid (3.97 mmol, 1.2 mol eq) was reacted with thionyl chloride (4.30mmol, 1.3 mol eq) under inert conditions at reflux. The resulting acid chloride was converted to isothiocyanate by adding potassium thiocyanate (4.96mmol, 1.5 mol eq). Amantadine (3,31mmol, 1 mol eq) was added to reaction mixture and heated to 40°C for 1.5 hours. The reaction mixture was pure in crushed ice the crude product precipitated out and recrystallized in ethanol.

Synthetic pathway to ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-(benzoylimino)-4-oxothiazolidin-5-ylidene)acetate



The obtained acyl thioureas in above reaction (1.27mmol, 1 mol eq) were further reacted with ethyl 4-ethoxypent-4-en-2-ynoate (2.54mmol, 2 mol eq) at room temperature. The final product iminothiozolidinone precipitated out during reaction. The product was filtered, recrystallized in ethanol, and dried¹.

¹³C-NMR of Ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((2-methylbenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE1)

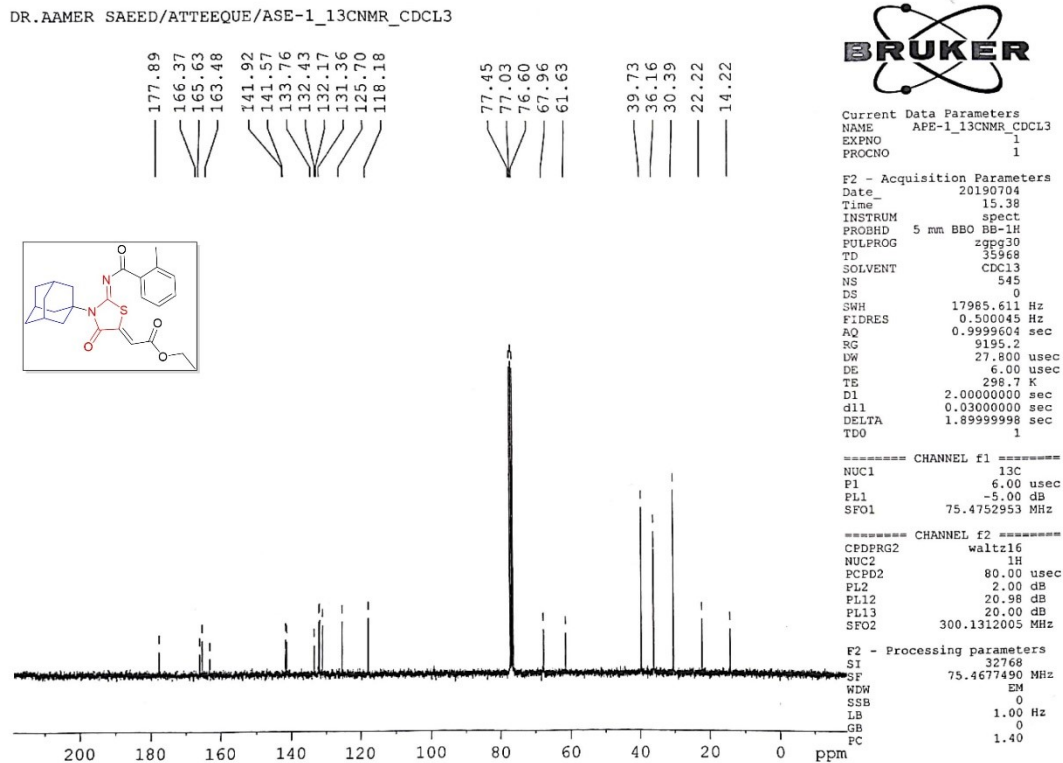


Figure. ¹³C-NMR (75 MHz, CDCl₃) spectrum of compound ASE-1.

FTIR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((2-methylbenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-1)

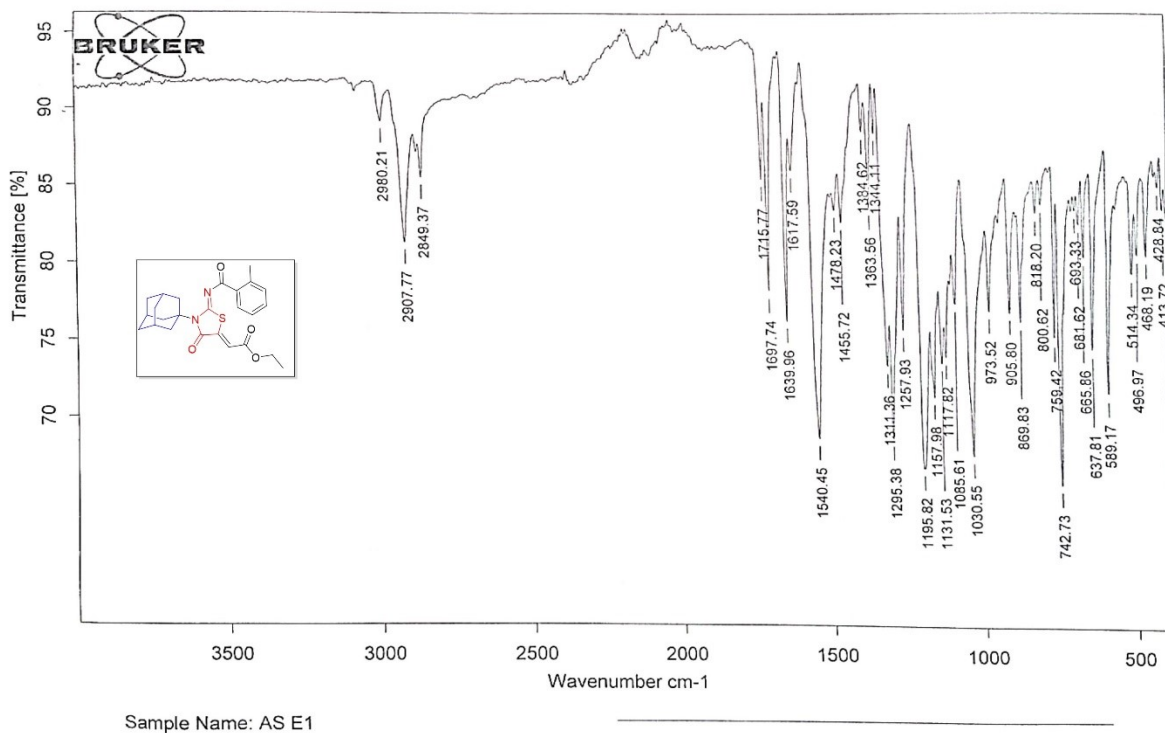


Figure. FTIR spectrum of compound ASE-1.

FTIR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((3-methylbenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-2)

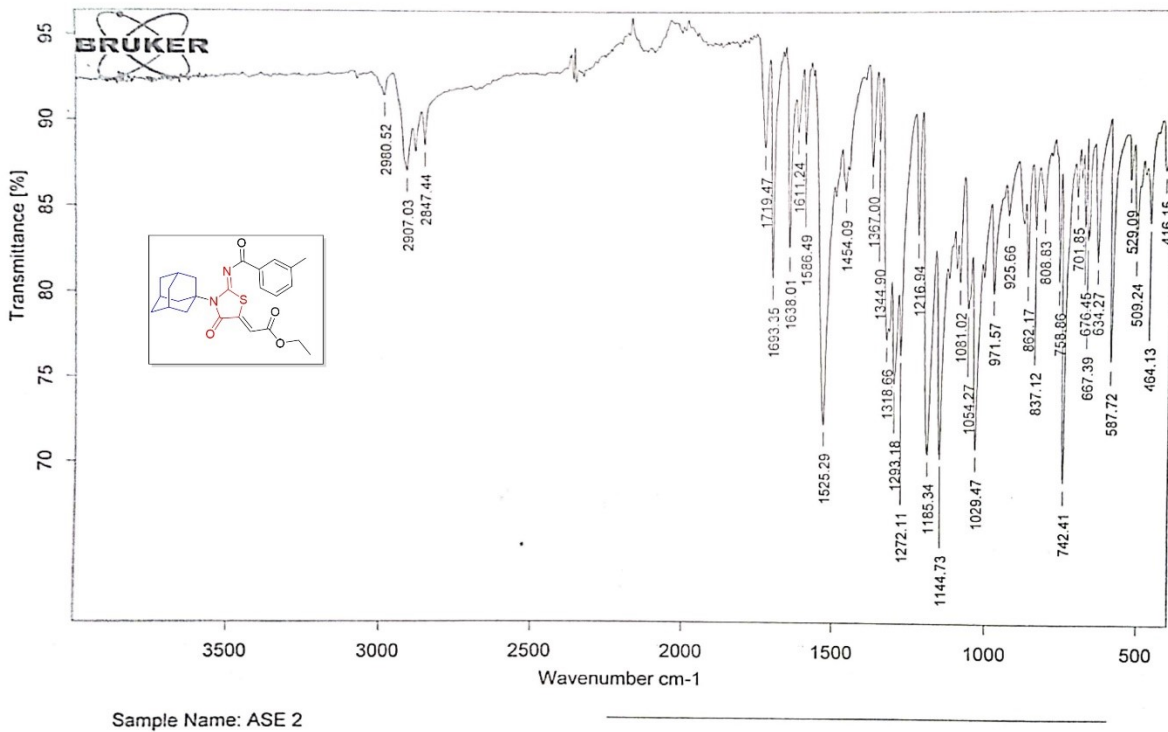


Figure. FTIR spectrum of compound ASE-2.

¹H-NMR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((3-methoxybenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-3)

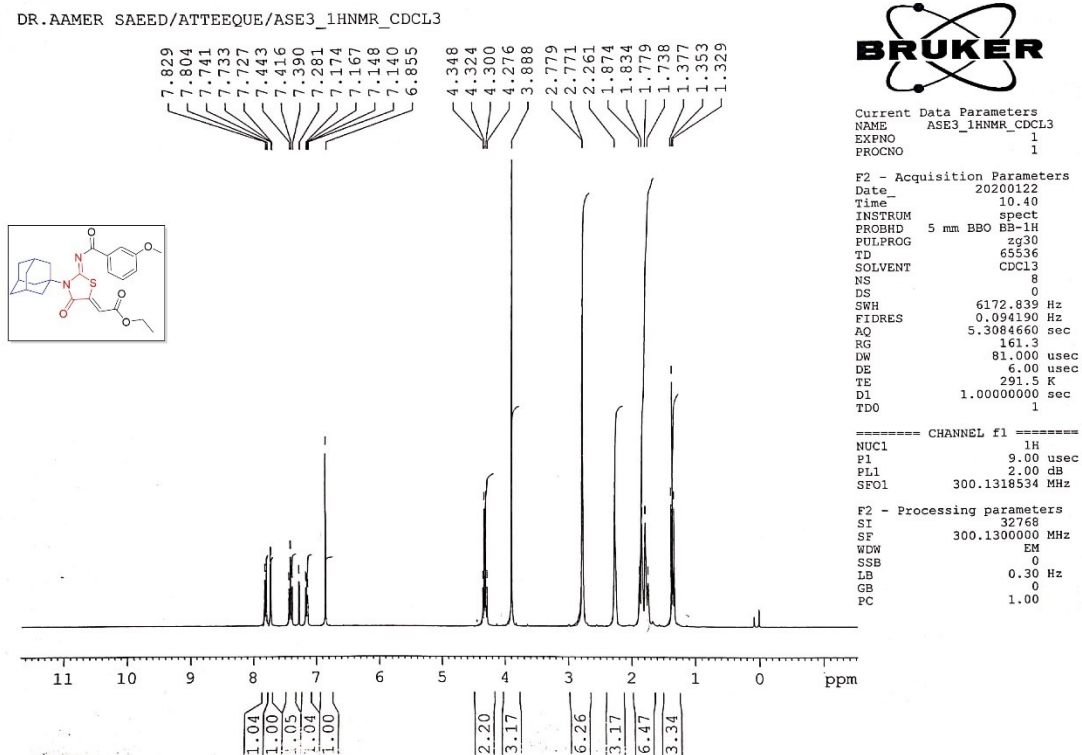


Figure. ¹H-NMR (300 MHz, CDCl₃) spectrum of compound ASE-3.

¹³C-NMR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((3-methoxybenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-3)

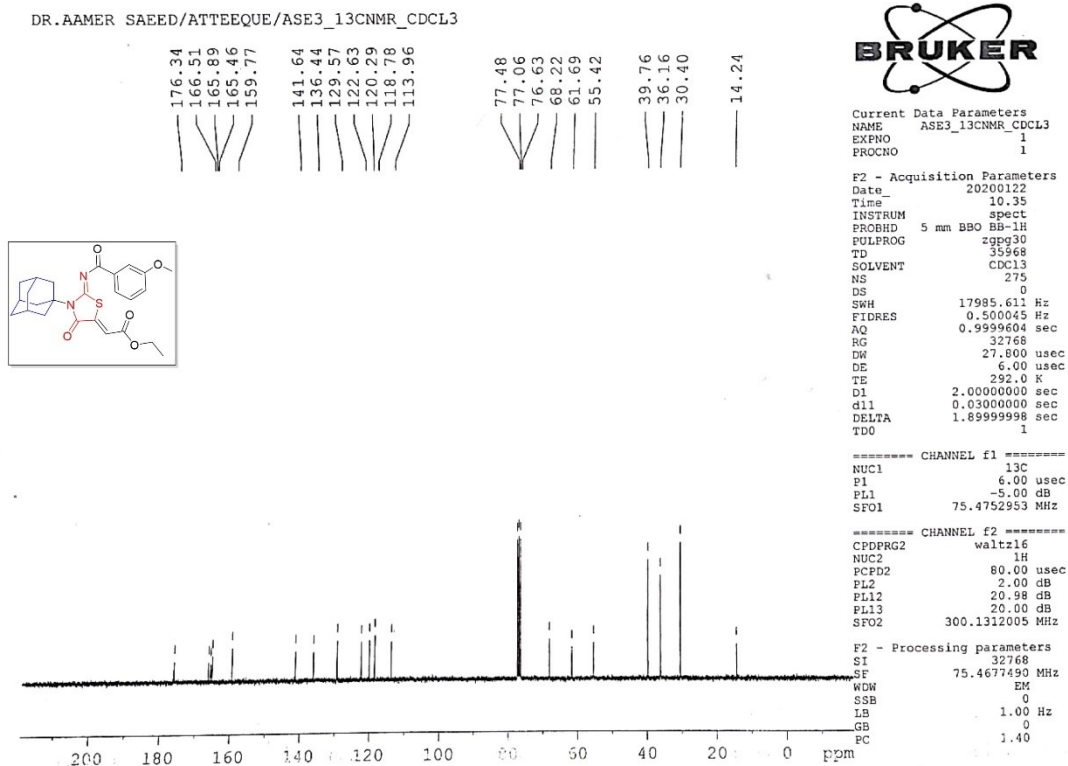
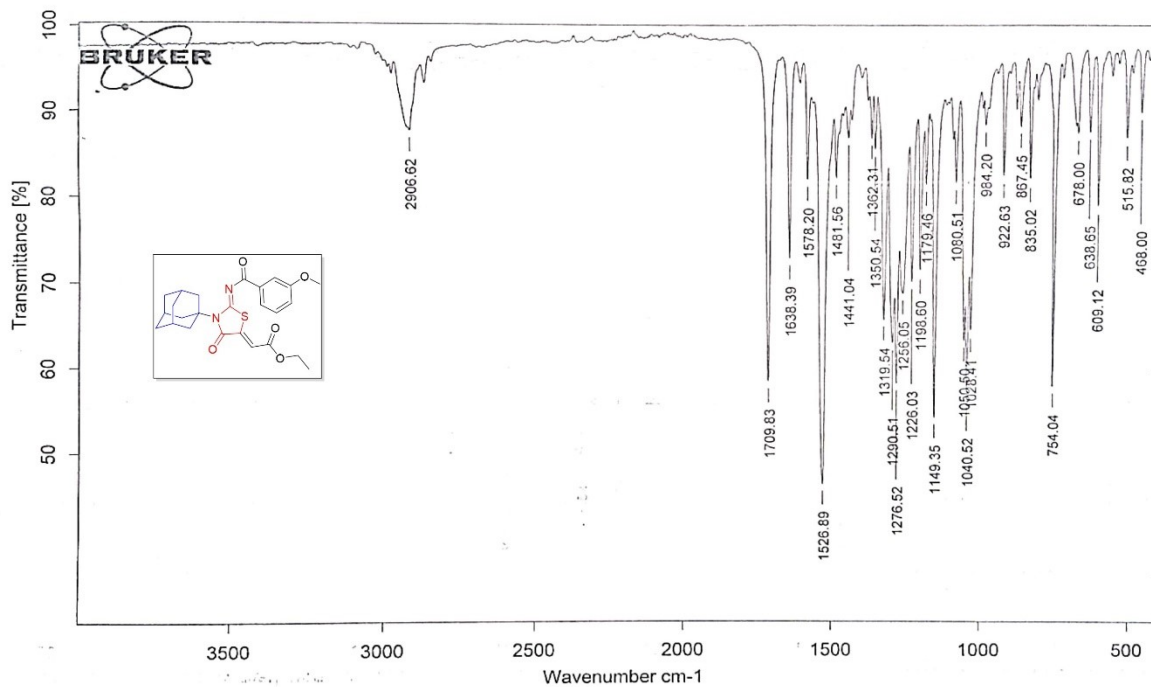


Figure. ¹³C-NMR (75 MHz, CDCl₃) spectrum of compound ASE-3.

FTIR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((3-methoxybenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-3)



Sample Name: ASE3

Figure. FTIR spectrum of compound ASE-3.

¹H-NMR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((4-bromobenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-5)

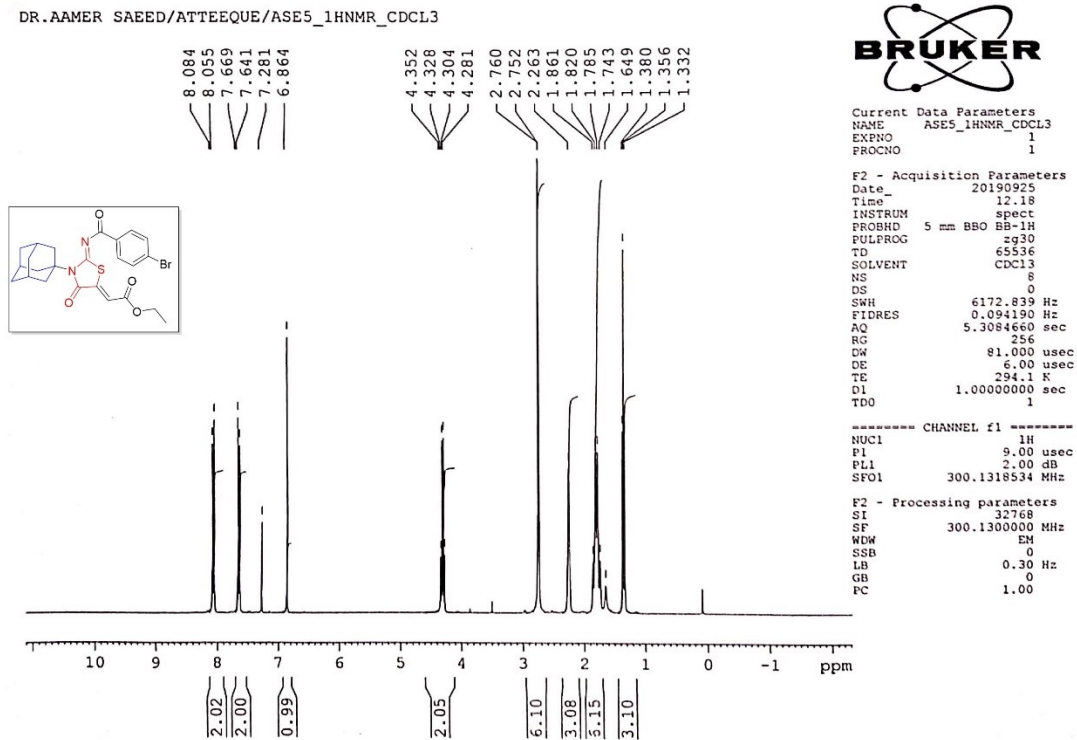


Figure. ¹H-NMR (300 MHz, CDCl₃) spectrum of compound ASE-5.

¹³C-NMR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((4-bromobenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-5)

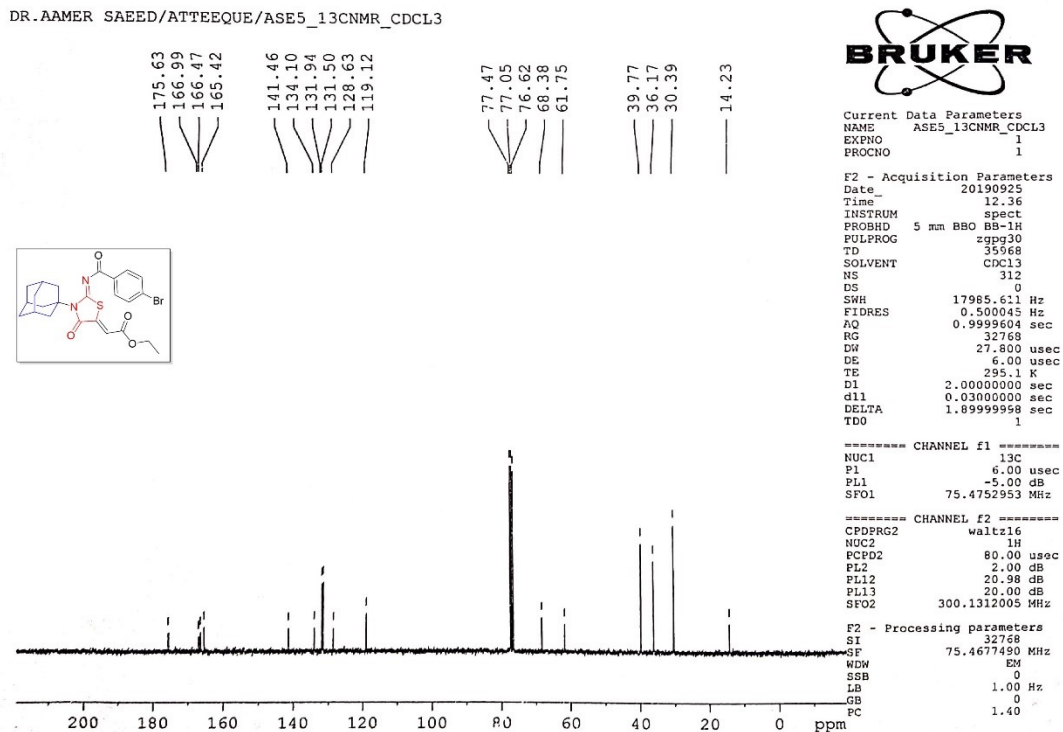


Figure. ¹³C-NMR (75 MHz, CDCl₃) spectrum of compound ASE-5.

FTIR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((4-bromobenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-5)

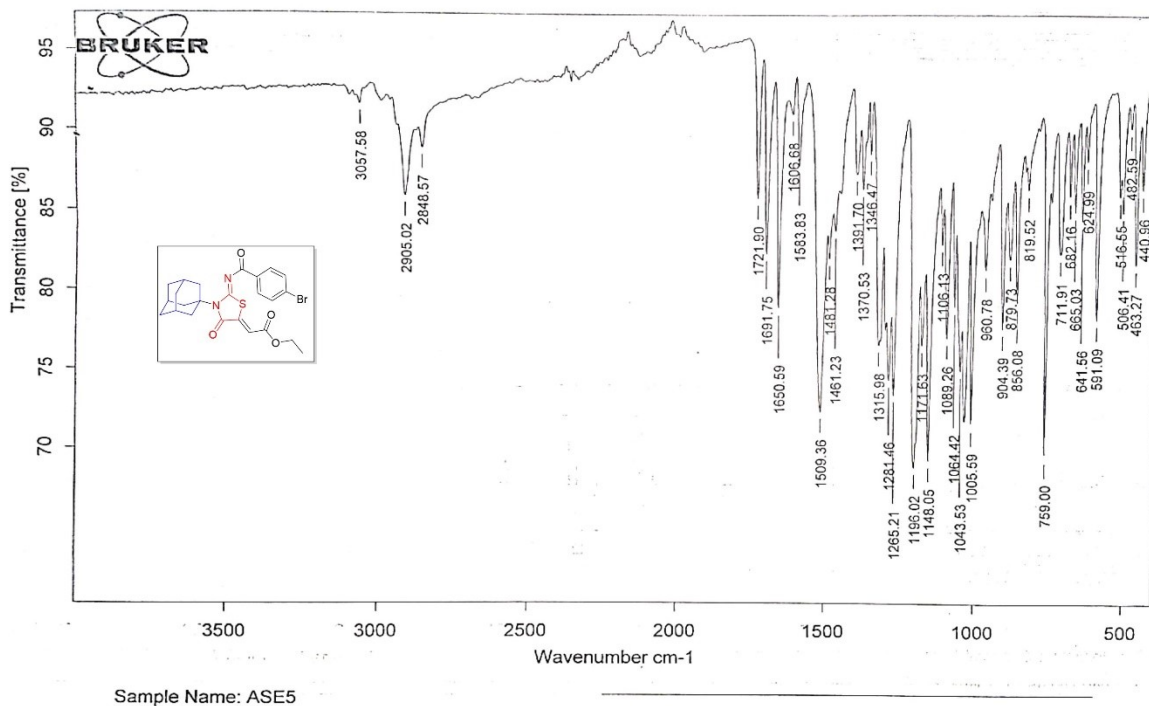


Figure. FTIR spectrum of compound ASE-5.

¹H-NMR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((3-chlorobenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-7)

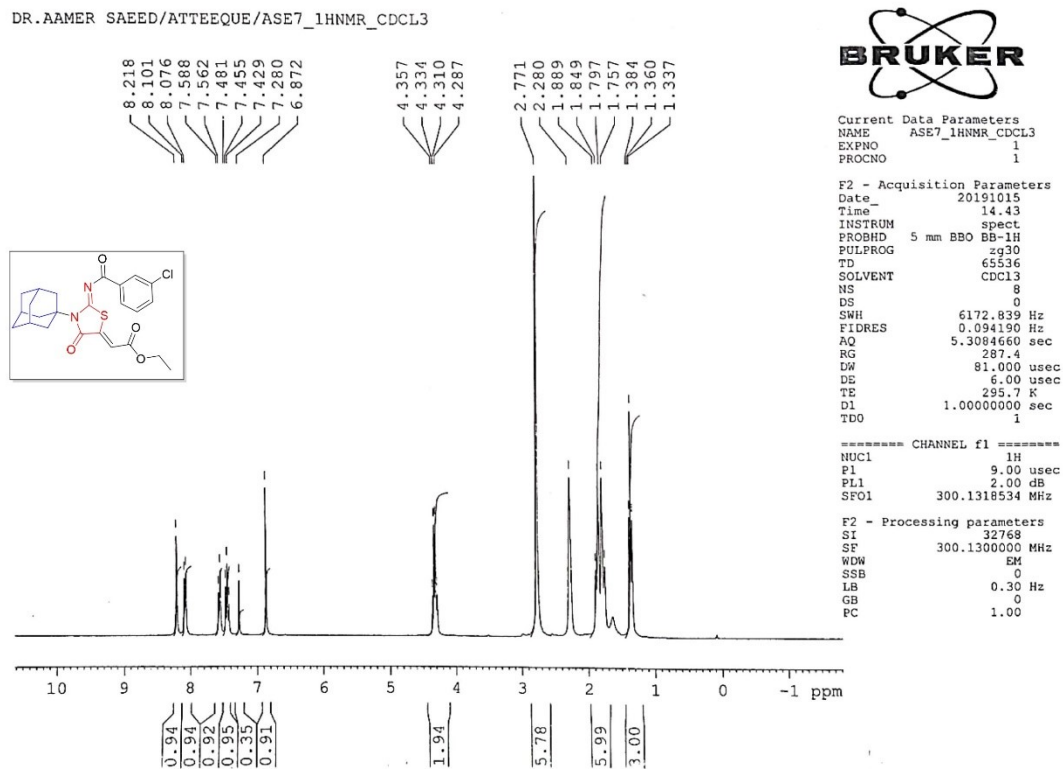


Figure. ¹H-NMR (300 MHz, CDCl₃) spectrum of compound ASE-7.

¹³C-NMR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((3-chlorobenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-7)

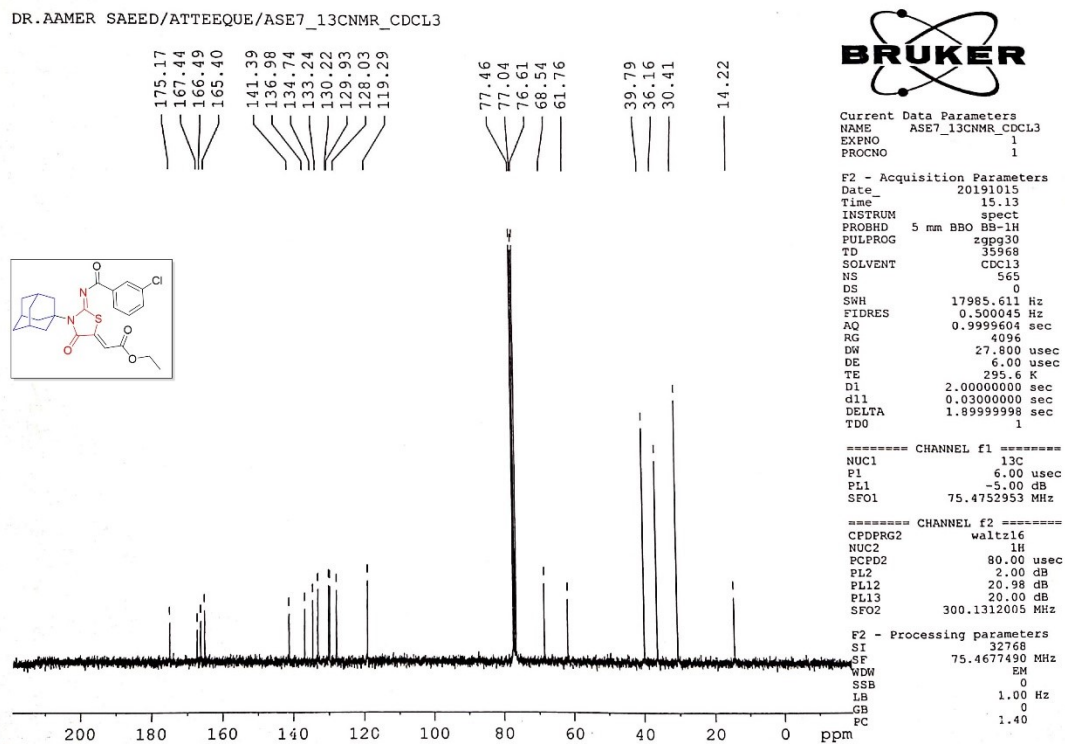


Figure. ¹³C-NMR (75 MHz, CDCl₃) spectrum of compound ASE-7.

FTIR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((3-chlorobenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-7)

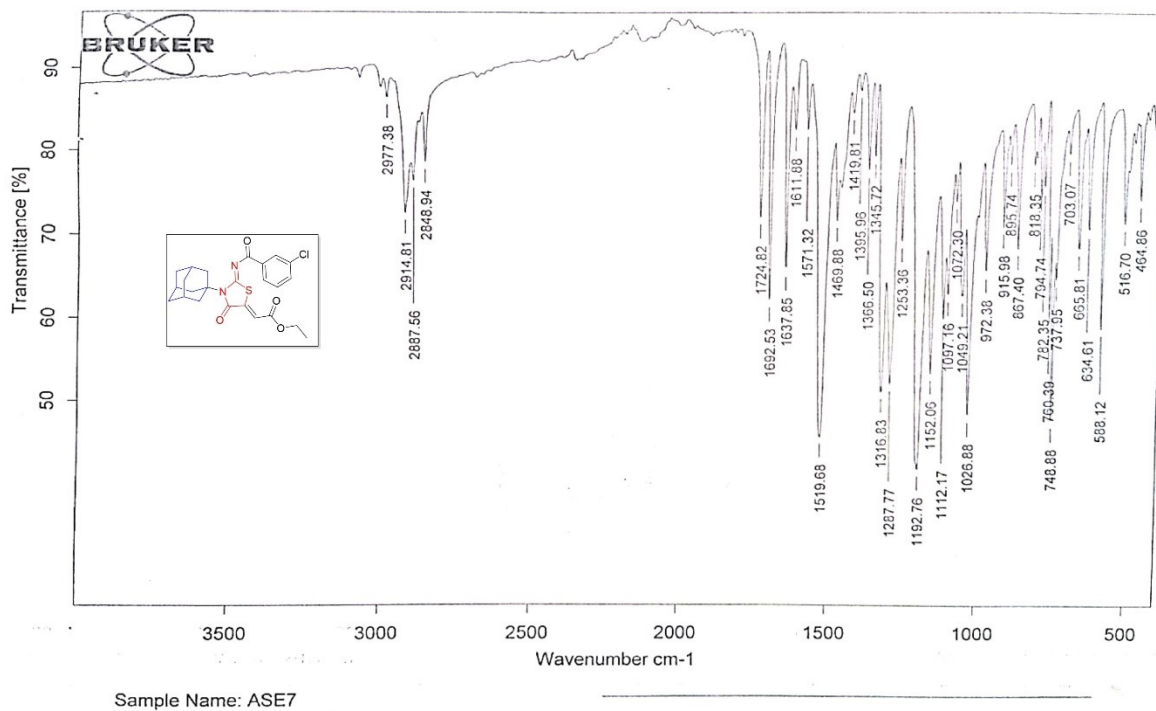


Figure. FTIR spectrum of compound ASE-7.

¹H-NMR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((4-fluorobenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-8)

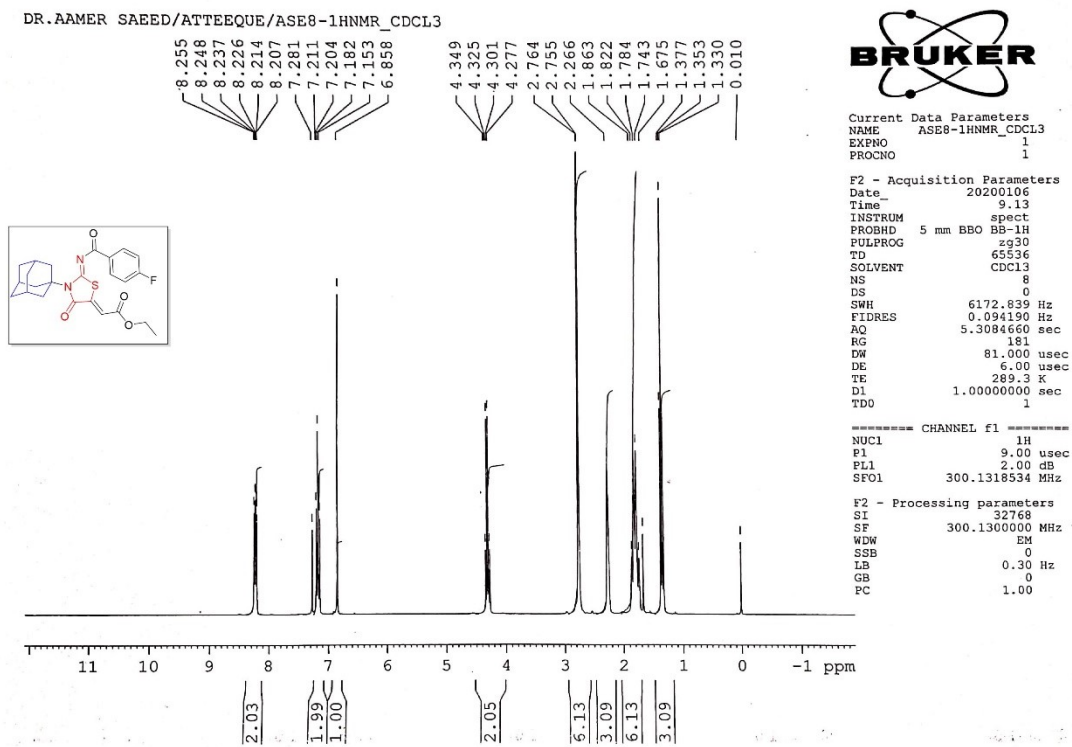


Figure. ¹H-NMR (300 MHz, CDCl₃) spectrum of compound ASE-8.

¹³C-NMR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((4-fluorobenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-8)

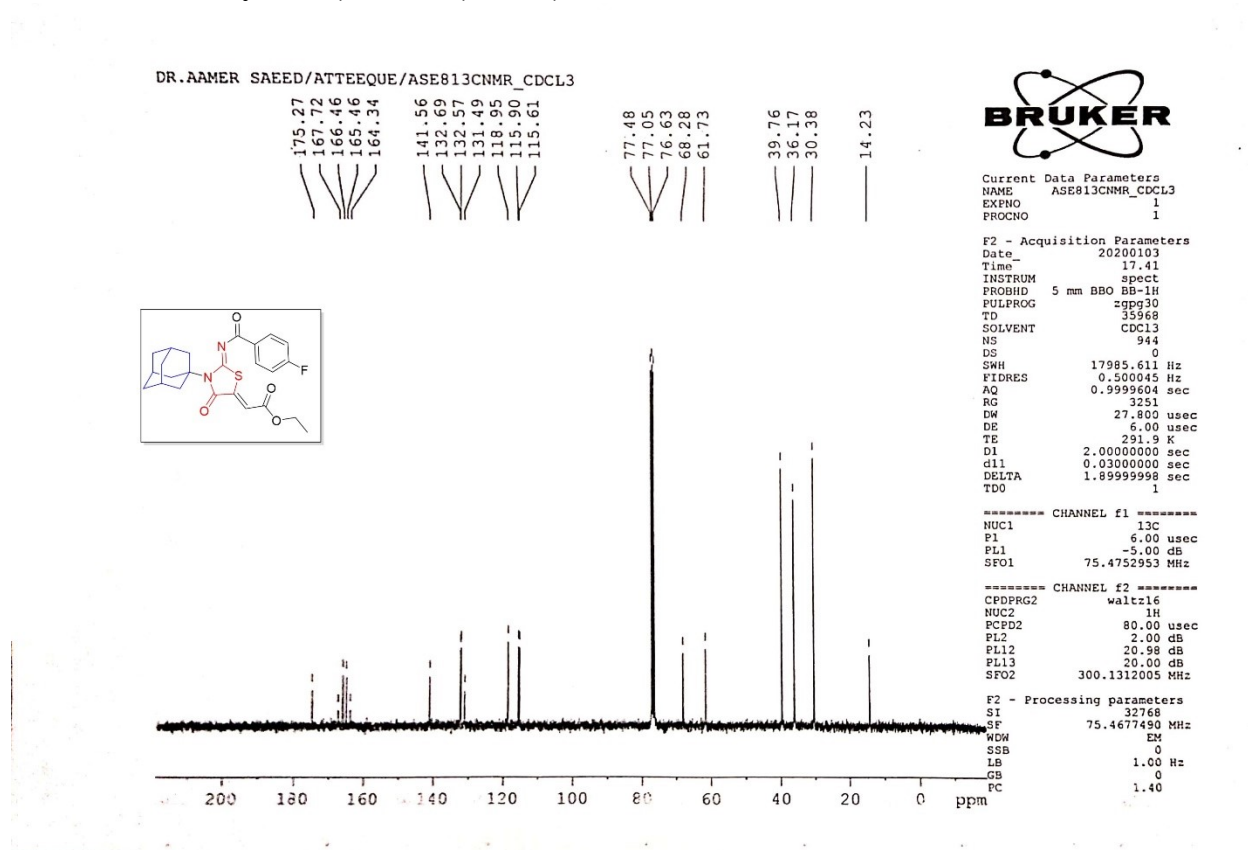


Figure. ¹³C-NMR (75 MHz, CDCl₃) spectrum of compound ASE-8.

FTIR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((4-fluorobenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-8)

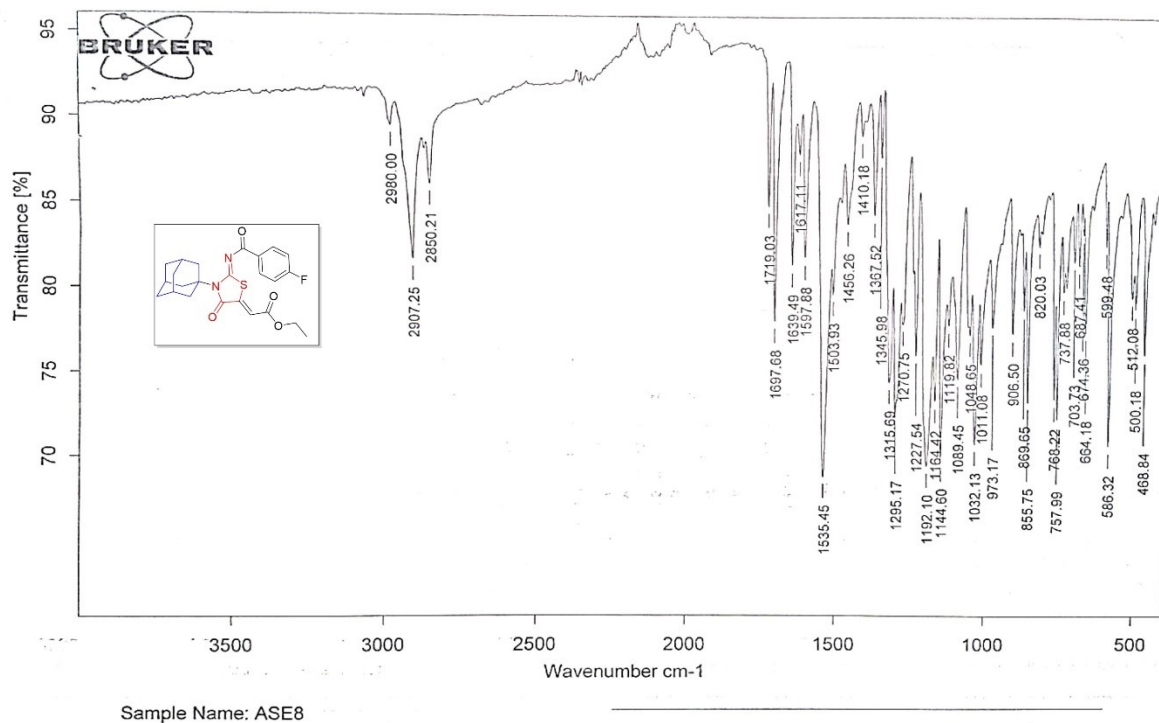


Figure. FTIR spectrum of compound ASE-8.

¹H-NMR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-(benzoylimino)-4-oxothiazolidin-5-ylidene)acetate (ASE-9)

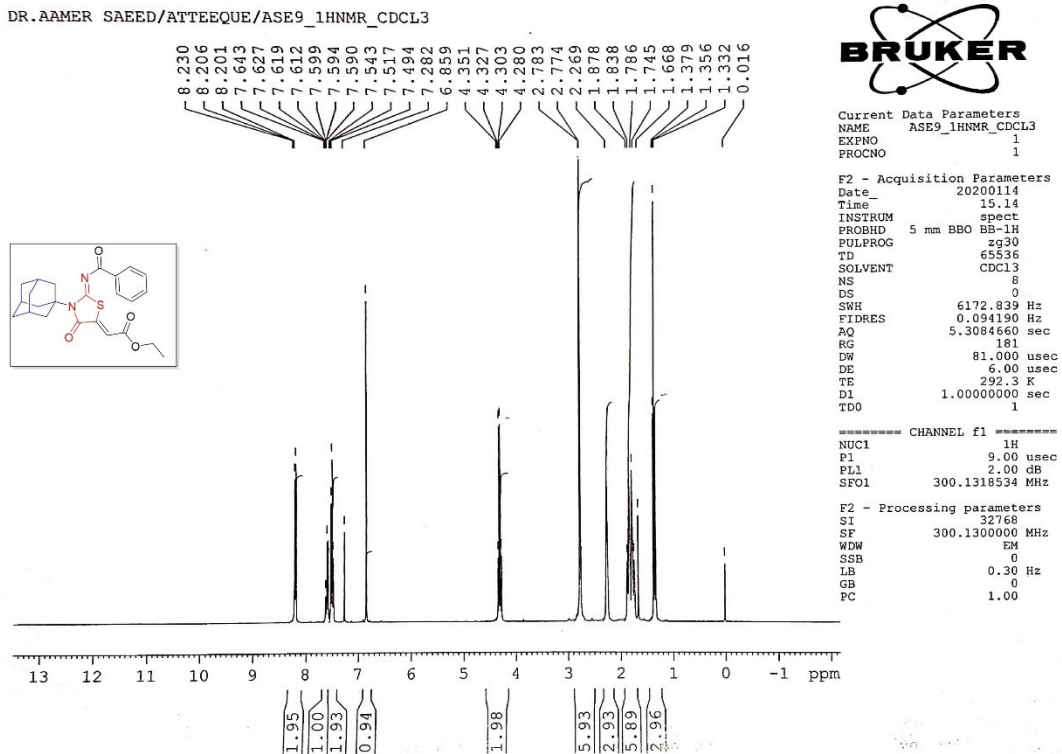


Figure. ¹H-NMR (300 MHz, CDCl₃) spectrum of compound ASE-9.

¹³C-NMR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-(benzoylimino)-4-oxothiazolidin-5-ylidene)acetate (ASE-9)

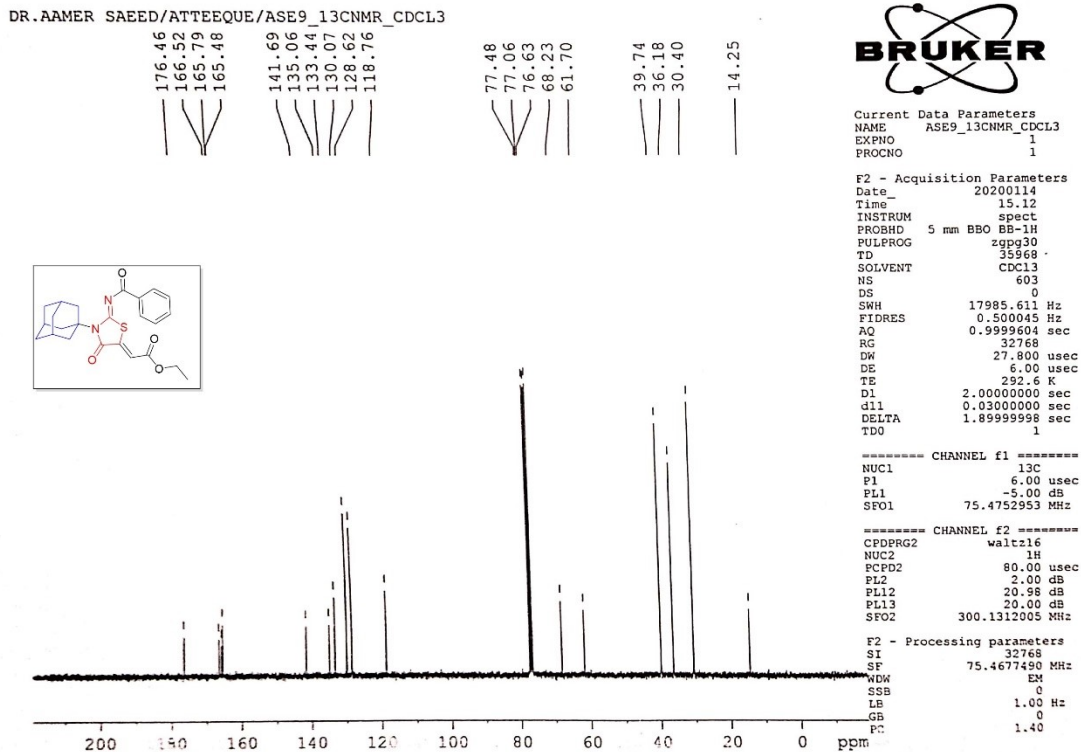


Figure. ¹³C-NMR (75 MHz, CDCl₃) spectrum of compound ASE-9.

FTIR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-(benzoylimino)-4-oxothiazolidin-5-ylidene)acetate (ASE-9)

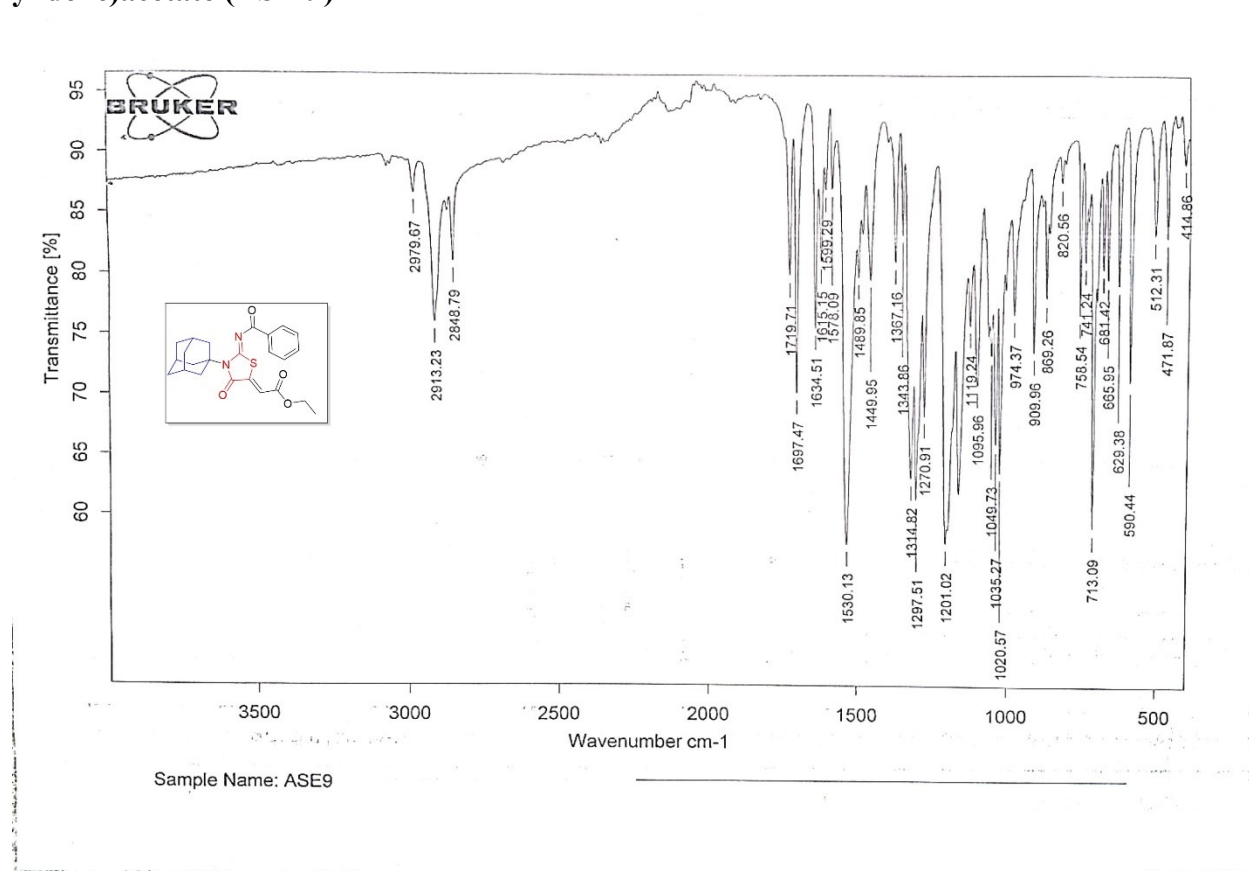


Figure. FTIR spectrum of compound ASE-9.

¹H-NMR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((4-chlorobenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-10)

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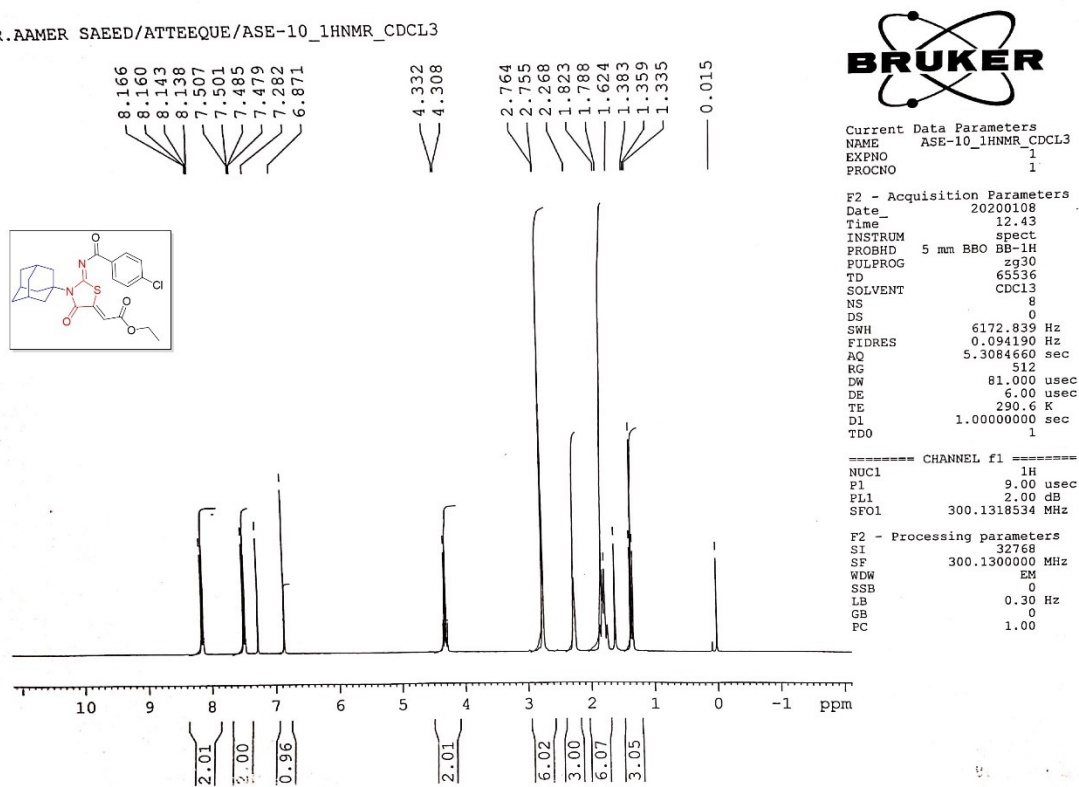


Figure. ¹H-NMR (300 MHz, CDCl₃) spectrum of compound ASE-10.

^{13}C -NMR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((4-chlorobenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-10)

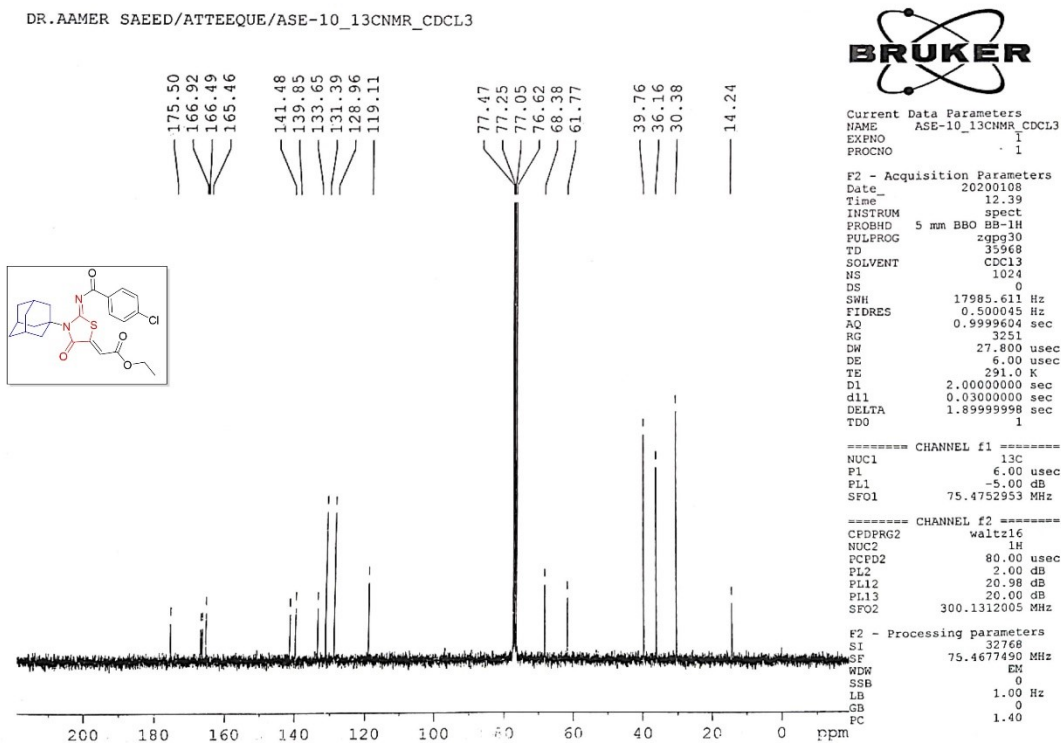


Figure. ^{13}C -NMR (75 MHz, CDCl_3) spectrum of compound ASE-10.

FTIR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((4-chlorobenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-10)

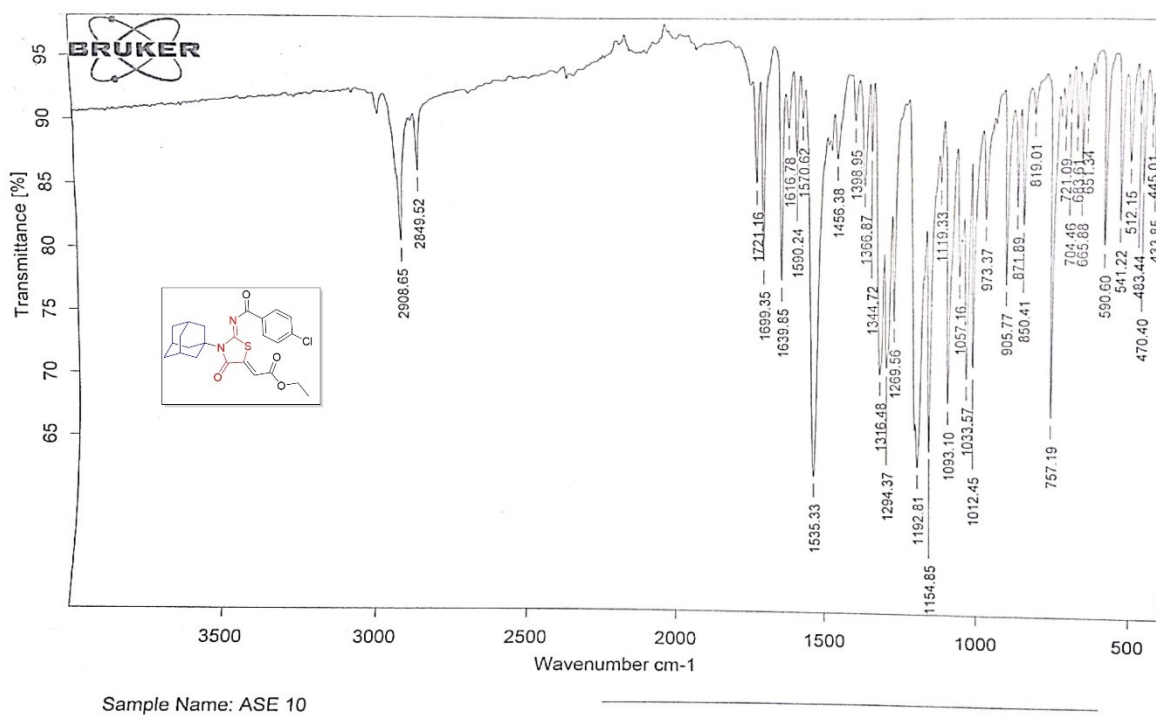


Figure. FTIR spectrum of compound ASE-10.

¹H-NMR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((2-chlorobenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-11)

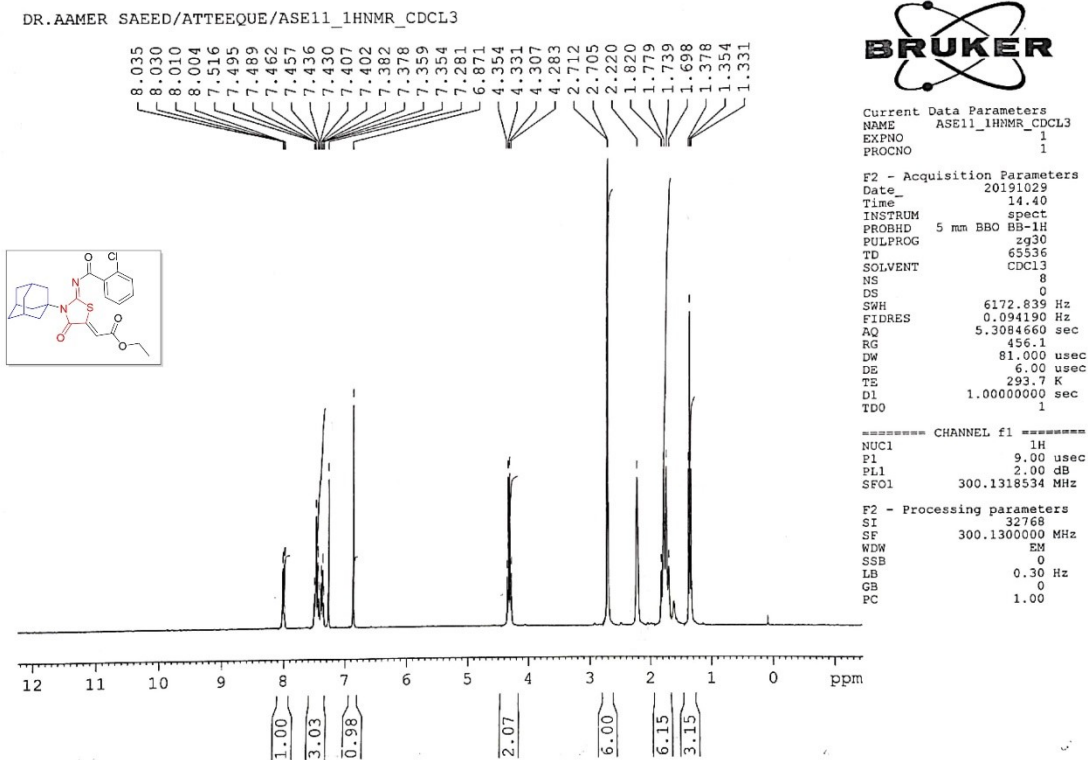


Figure. ¹H-NMR (300 MHz, CDCl₃) spectrum of compound ASE-11.

¹³C-NMR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((2-chlorobenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-11)

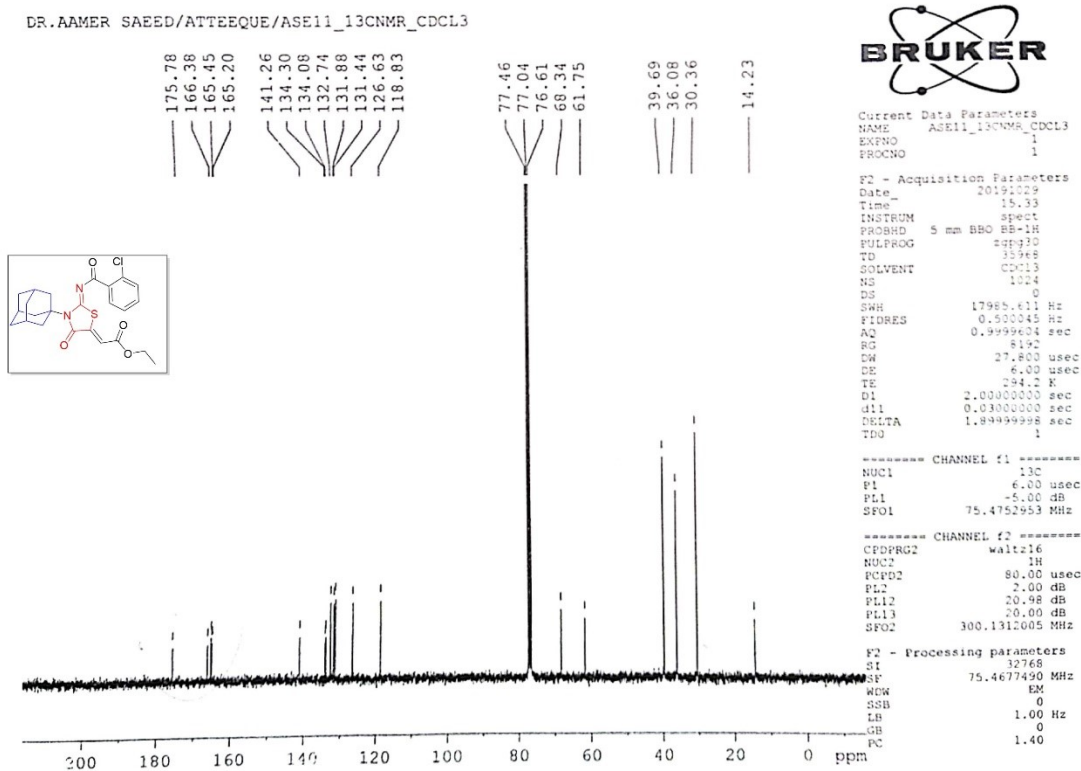


Figure. ¹³C-NMR (75 MHz, CDCl₃) spectrum of compound ASE-11.

FTIR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((2-chlorobenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-11)

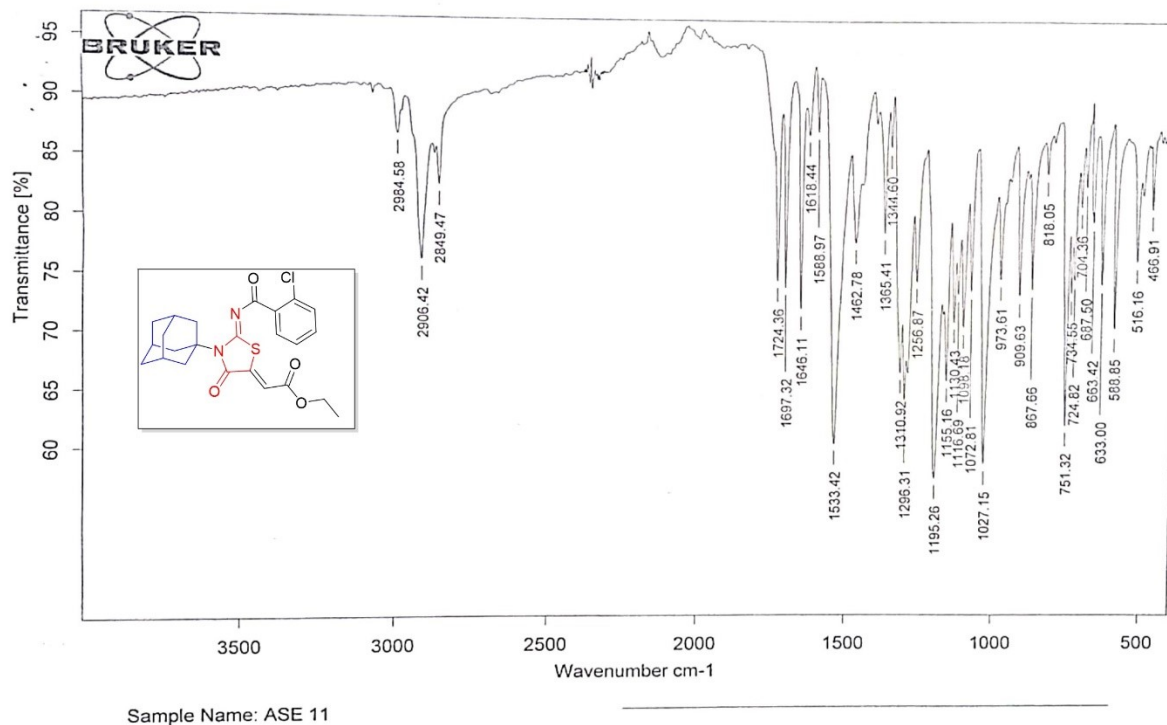


Figure. FTIR spectrum of compound ASE-11.

¹H-NMR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((4-methoxybenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-12)

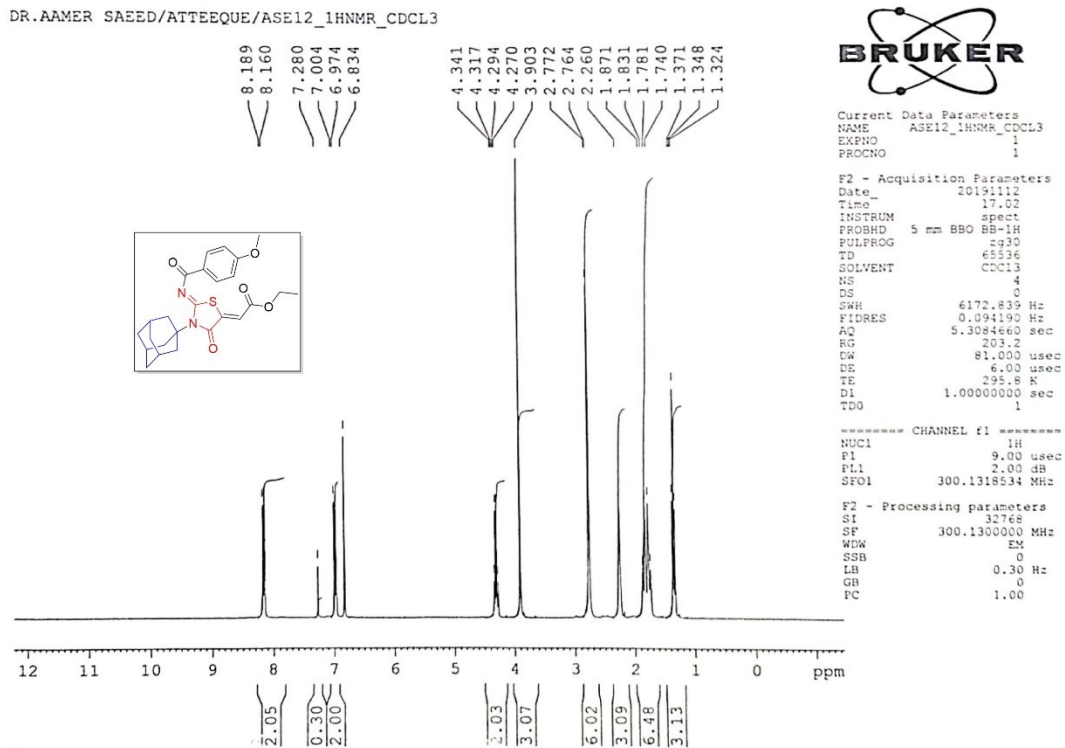


Figure. ¹H-NMR (300 MHz, CDCl₃) spectrum of compound ASE-12.

¹³C-NMR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((4-methoxybenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-12)

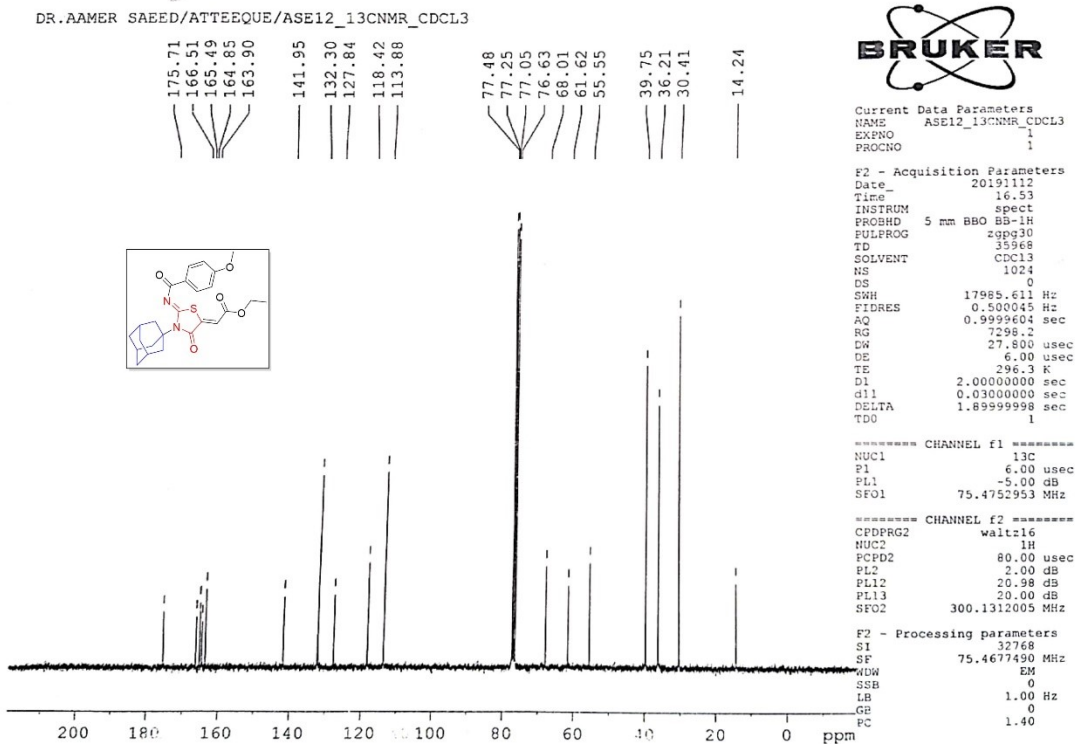


Figure. ¹³C-NMR (75 MHz, CDCl₃) spectrum of compound ASE-12.

FTIR of ethyl (Z)-2-((Z)-3-((3s,5s,7s)-adamantan-1-yl)-2-((4-methoxybenzoyl)imino)-4-oxothiazolidin-5-ylidene)acetate (ASE-12)

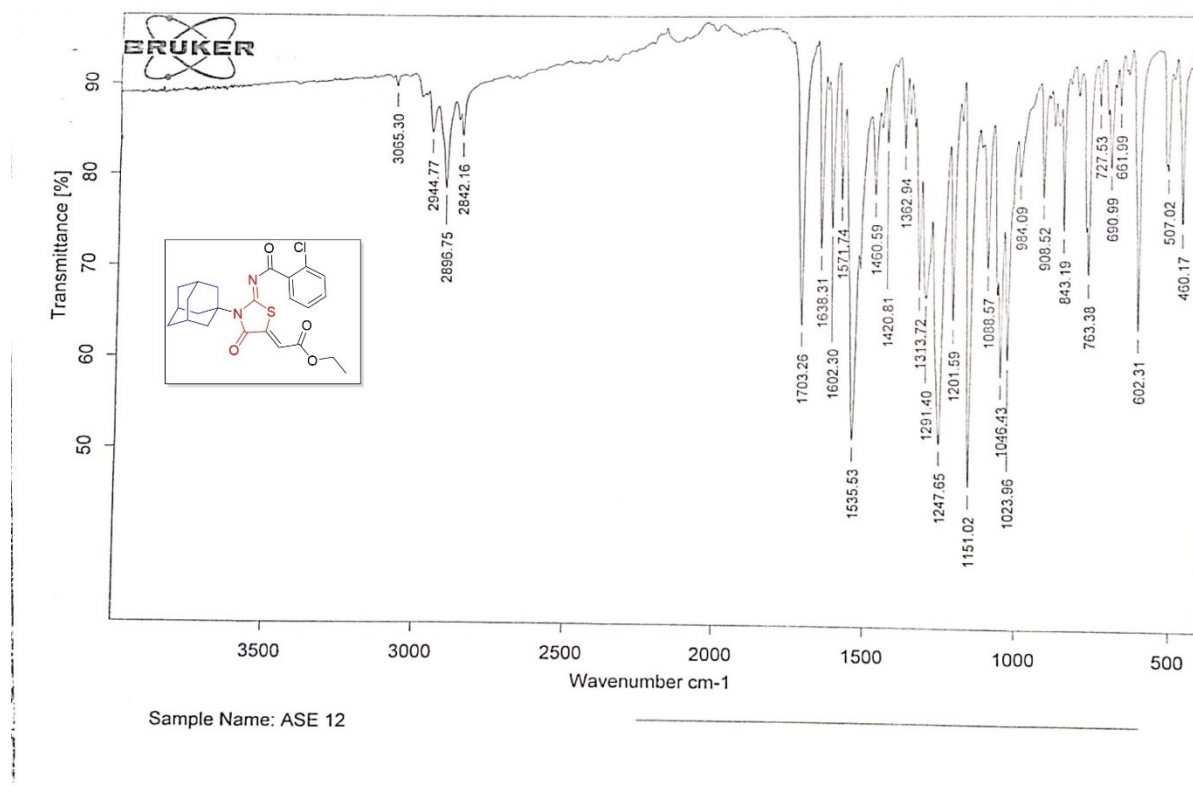


Figure. FTIR spectrum of compound ASE-12.

REFERENCES

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