Functionalization of Betulinic Acid with Polyphenolic Fragments for the Development of New Amphiphilic Antioxidants

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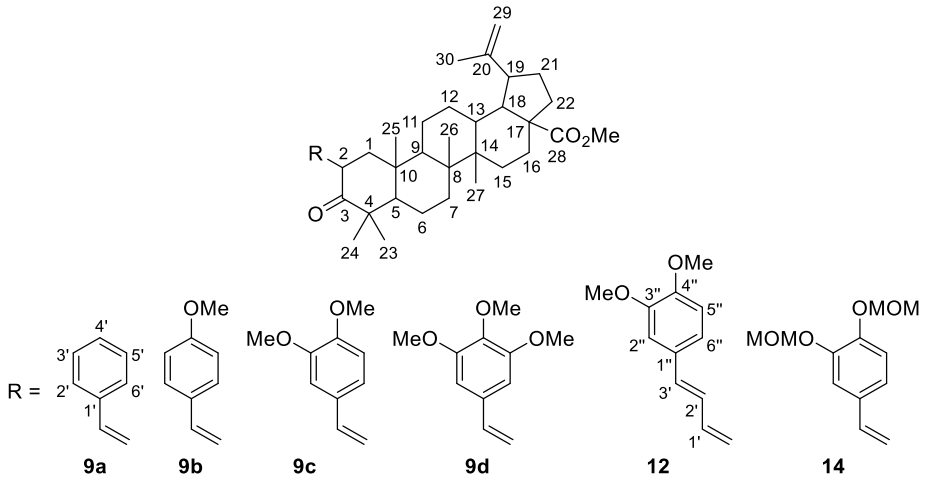

Figure S1. Structures and numbering system of methyl (*E*)-2-benzylidenebetulonate derivatives **9a-d** and **14**, and methyl (*E*,*E*)-2-allylidenebetulonate derivative **12**.

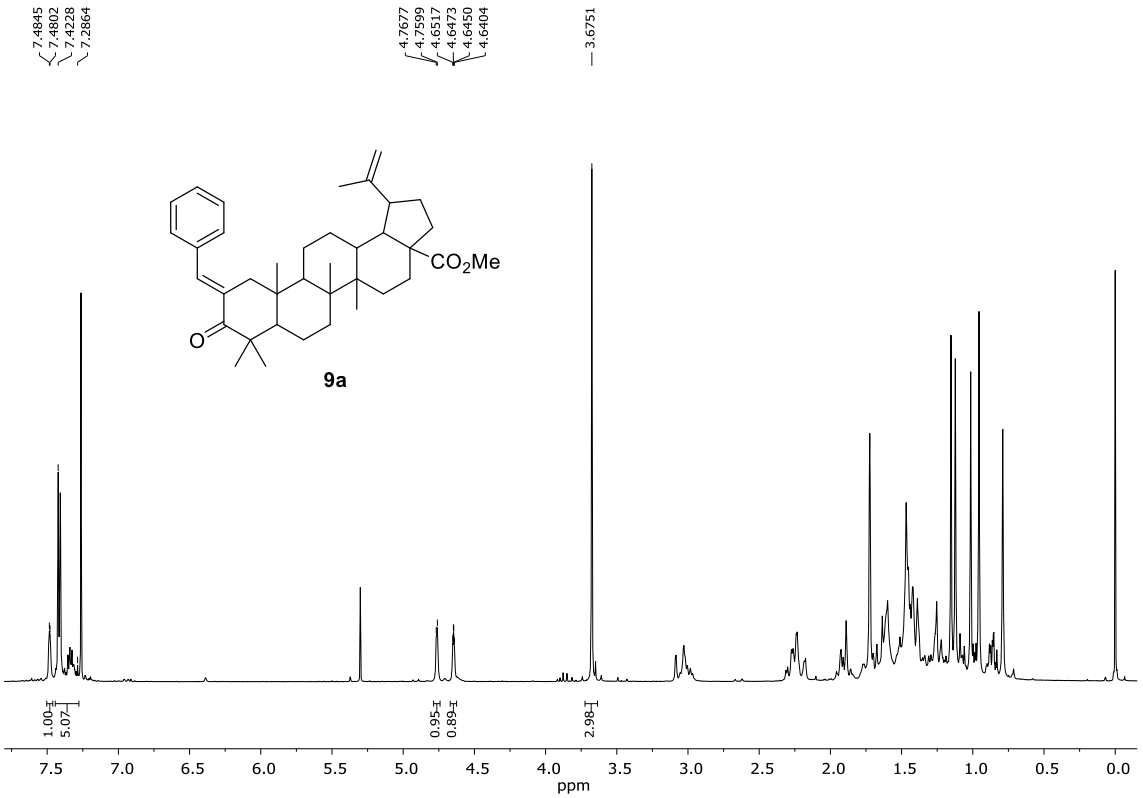

Figure S2. ^{1}H NMR spectrum of methyl (*E*)-2-benzylidenebetulonate (**9a**) (300.13 MHz, $CDCl_3$).

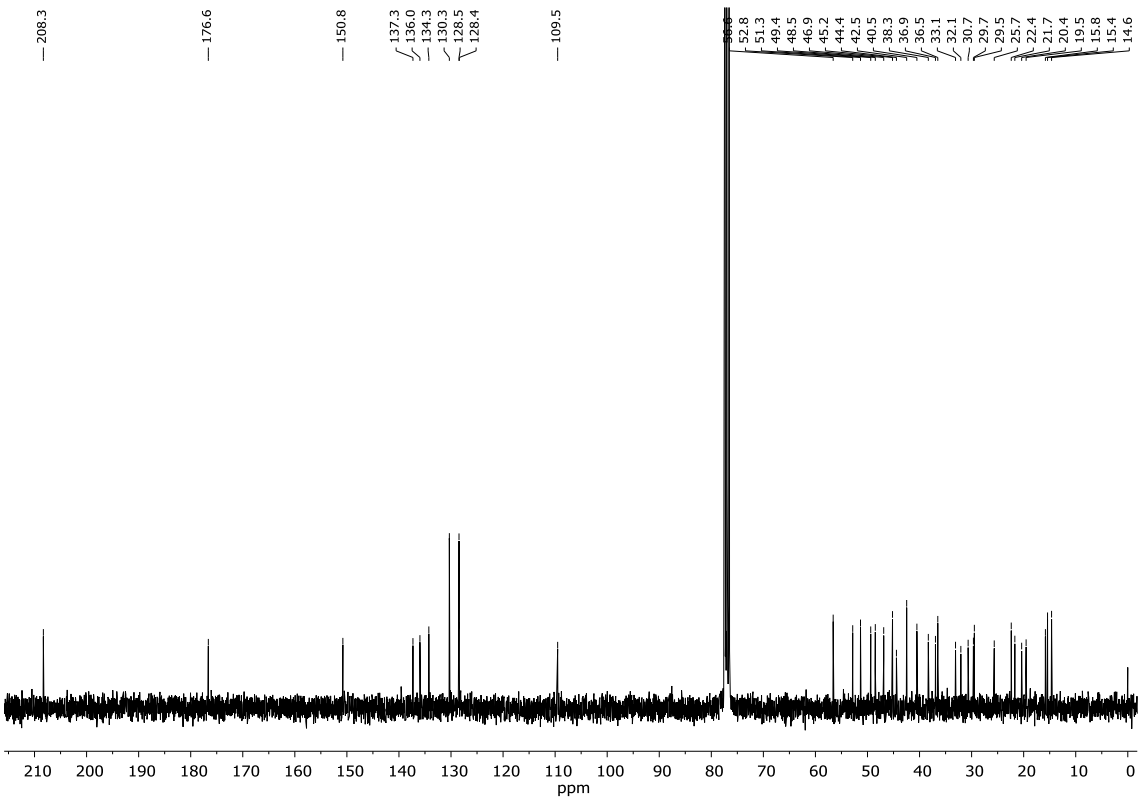

Figure S3. ^{13}C NMR spectrum of methyl (*E*)-2-benzylidenebetulonate (**9a**) (75.47 MHz, $CDCl_3$).

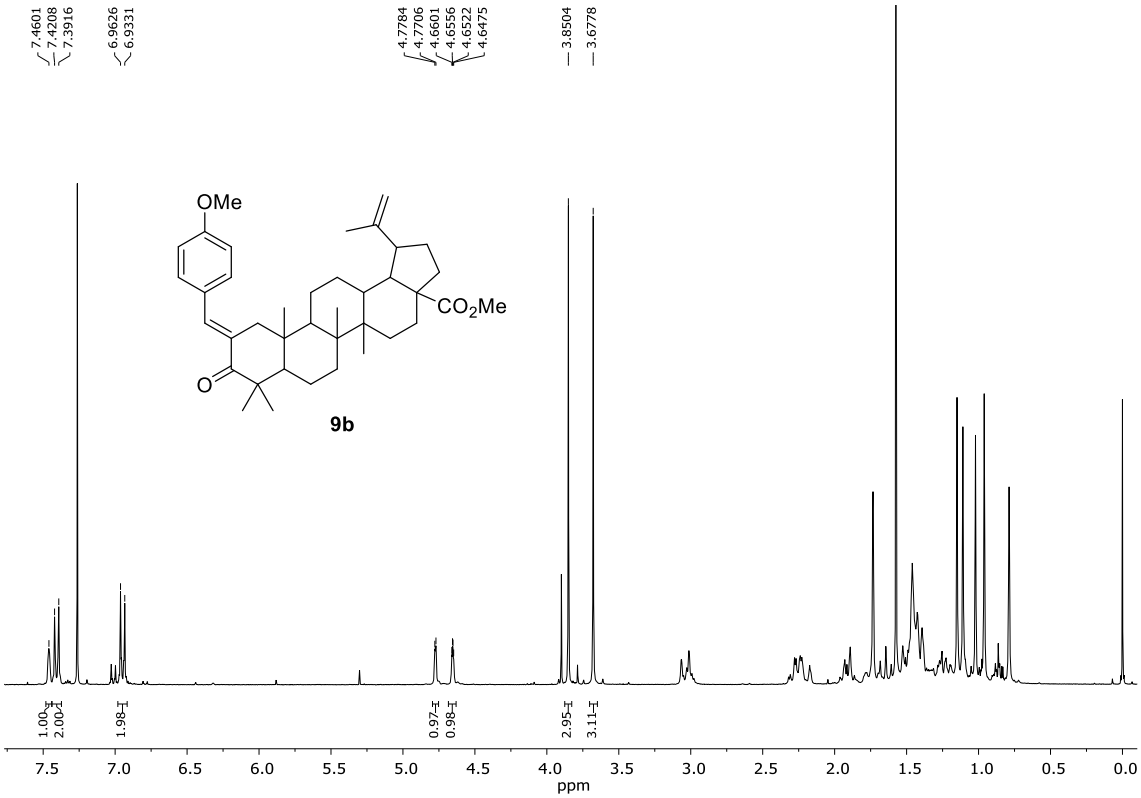

Figure S4. ^{1}H NMR spectrum of methyl (*E*)-2-(4-methoxybenzylidene)betulonate (**9b**) (300.13 MHz, $CDCl_3$).

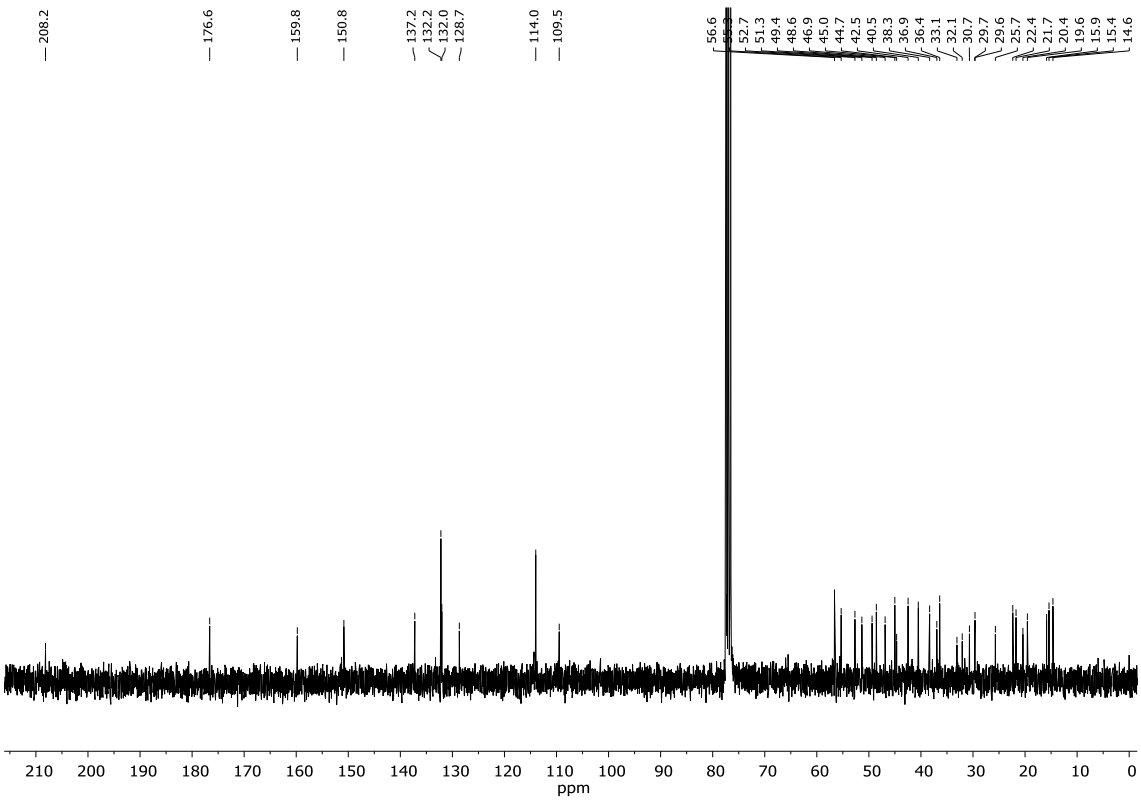

Figure S5. ^{13}C NMR spectrum of methyl (*E*)-2-(4-methoxybenzylidene)betulonate (**9b**) (75.47 MHz, $CDCl_3$).

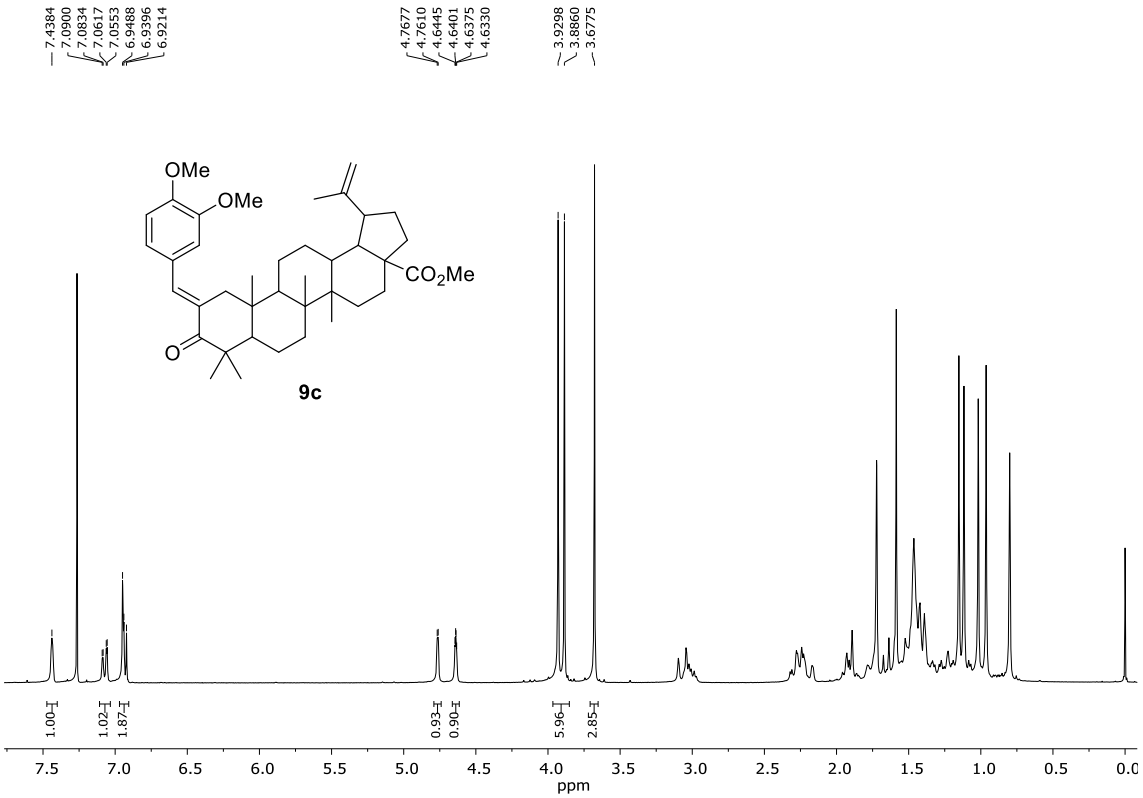

Figure S6. ^{1}H NMR spectrum of methyl (*E*)-2-(3,4-dimethoxybenzylidene)betulonate (**9c**) (300.13 MHz, $CDCl_3$).

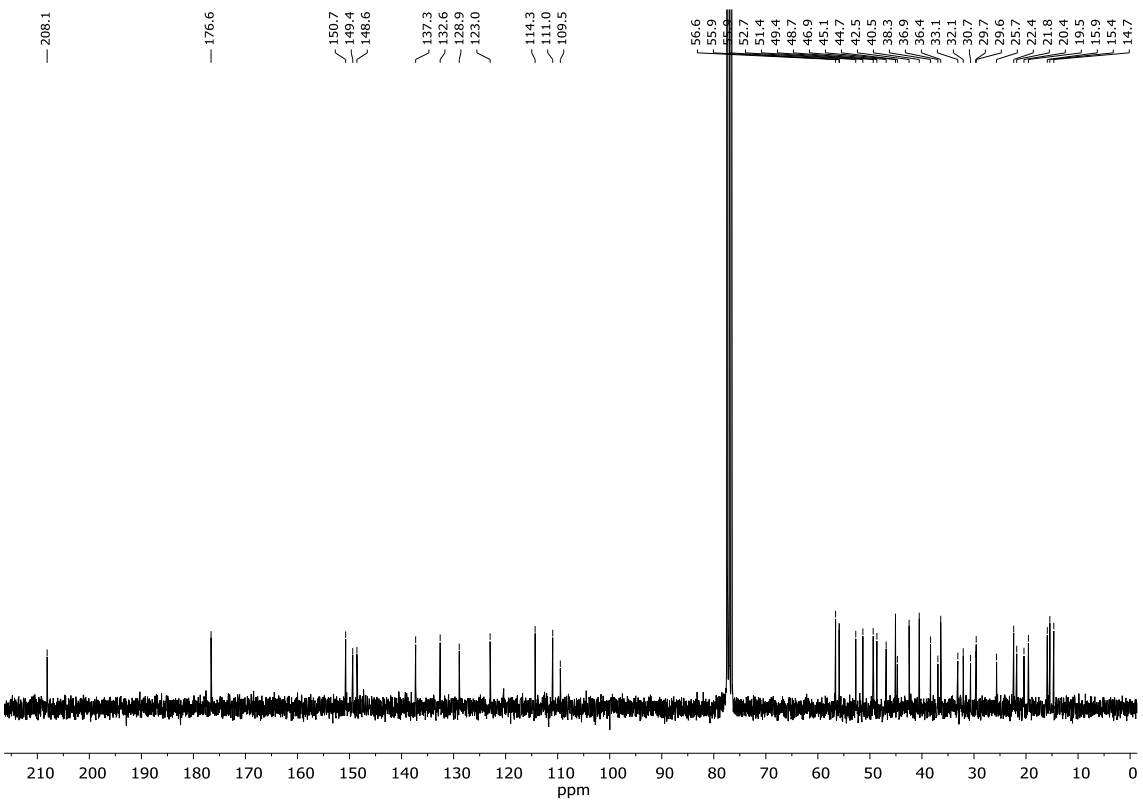

Figure S7. ^{13}C NMR spectrum of methyl (*E*)-2-(3,4-dimethoxybenzylidene)betulonate (**9c**) (75.47 MHz, $CDCl_3$).

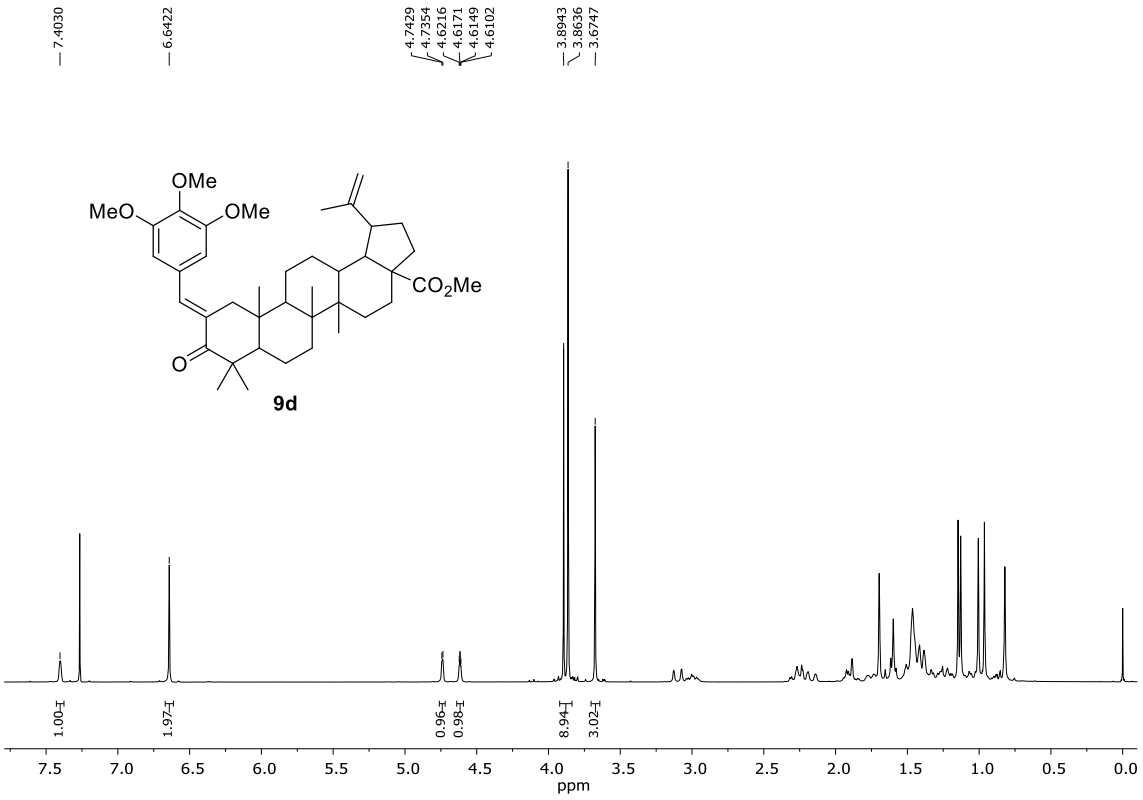

Figure S8. ^{1}H NMR spectrum of methyl (*E*)-2-(3,4,5-trimethoxybenzylidene)betulonate (**9d**) (300.13 MHz, $CDCl_3$).

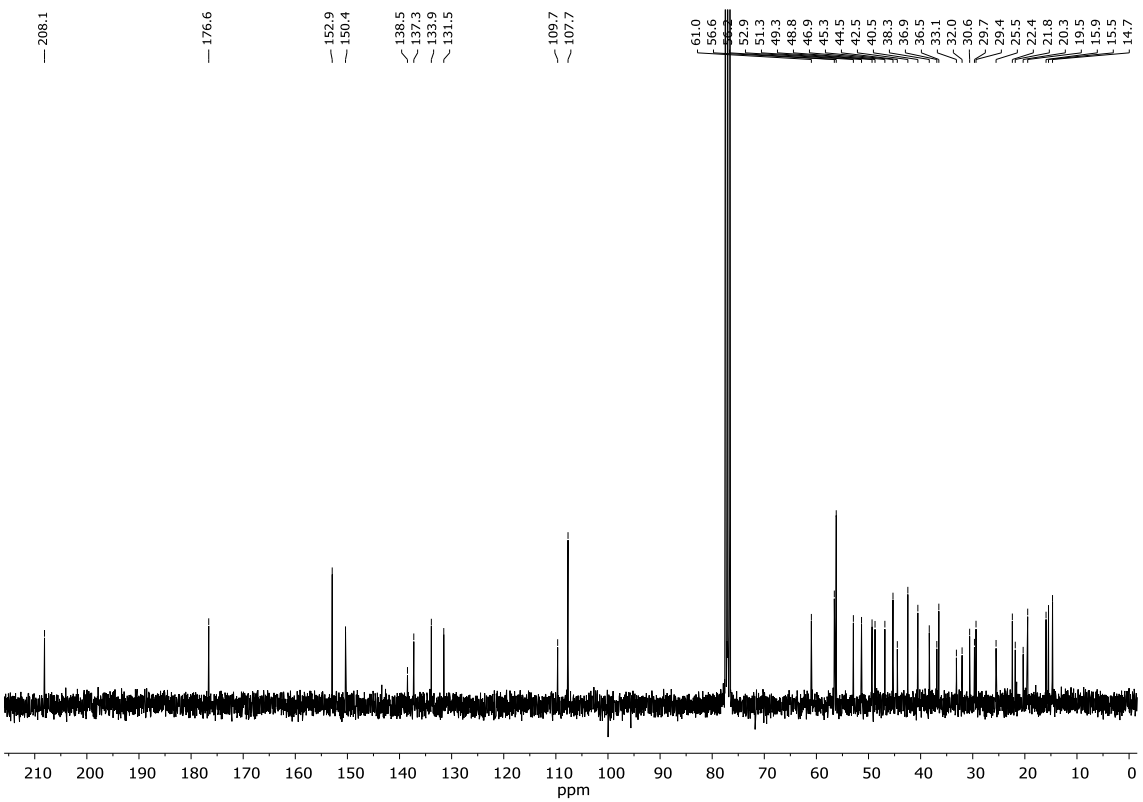

Figure S9. ^{13}C NMR spectrum of methyl (*E*)-2-(3,4,5-trimethoxybenzylidene)betulonate (**9d**) (75.47 MHz, $CDCl_3$).

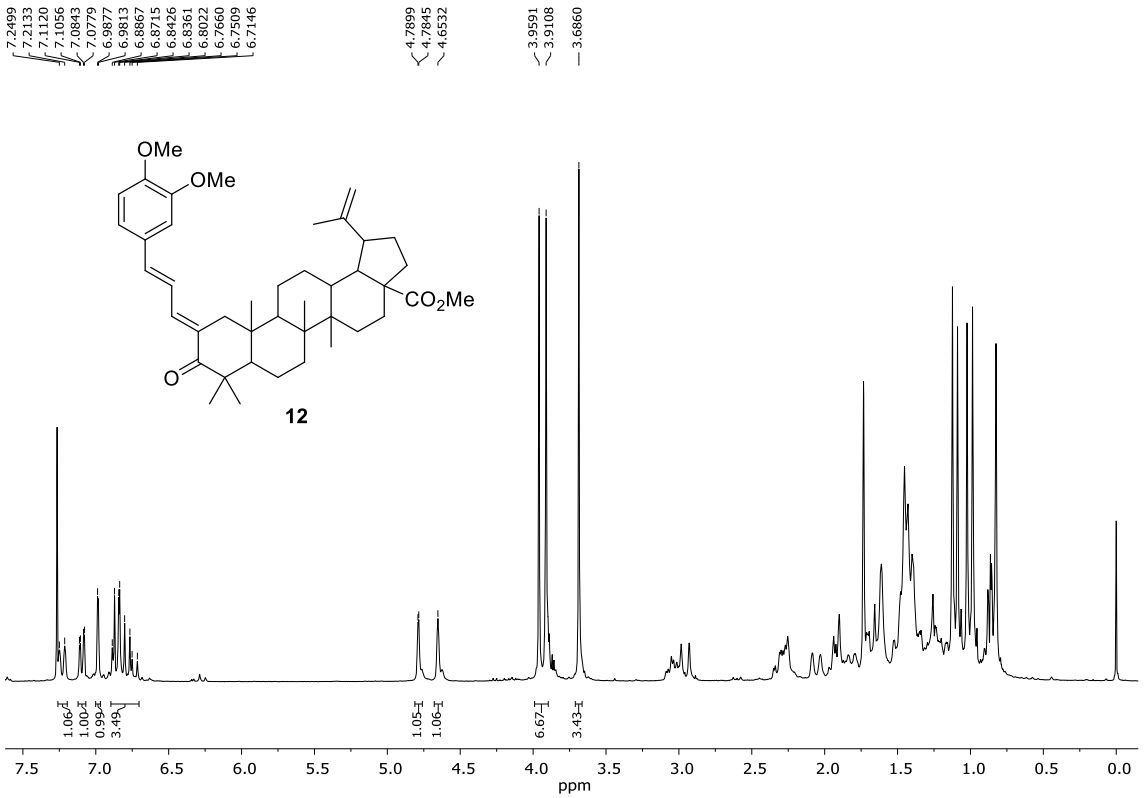

Figure S10. ^{1}H NMR spectrum of methyl (*E*,*E*)-2-[3-(3,4-dimethoxyphenyl)allylidene]betulonate (**12**) (300.13 MHz, $CDCl_3$).

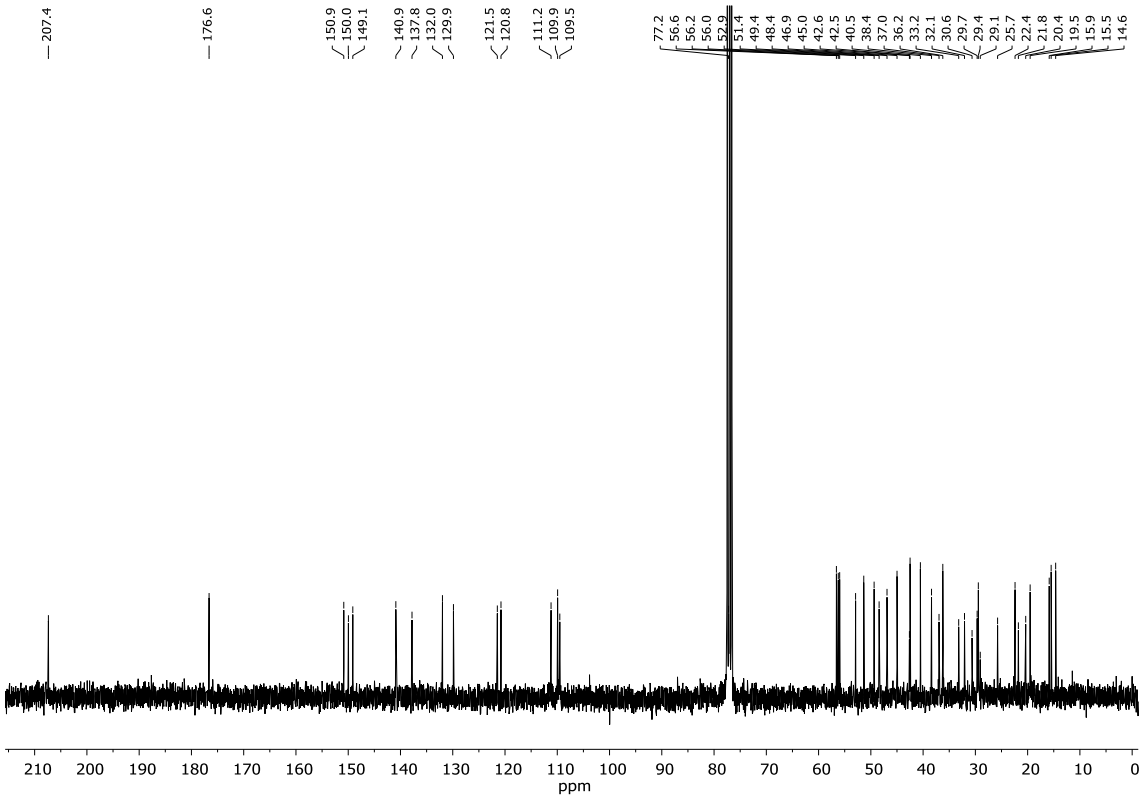

Figure S11. ^{13}C NMR spectrum of methyl (*E*,*E*)-2-[3-(3,4-dimethoxyphenyl)allylidene]betulonate (**12**) (75.47 MHz, $CDCl_3$).

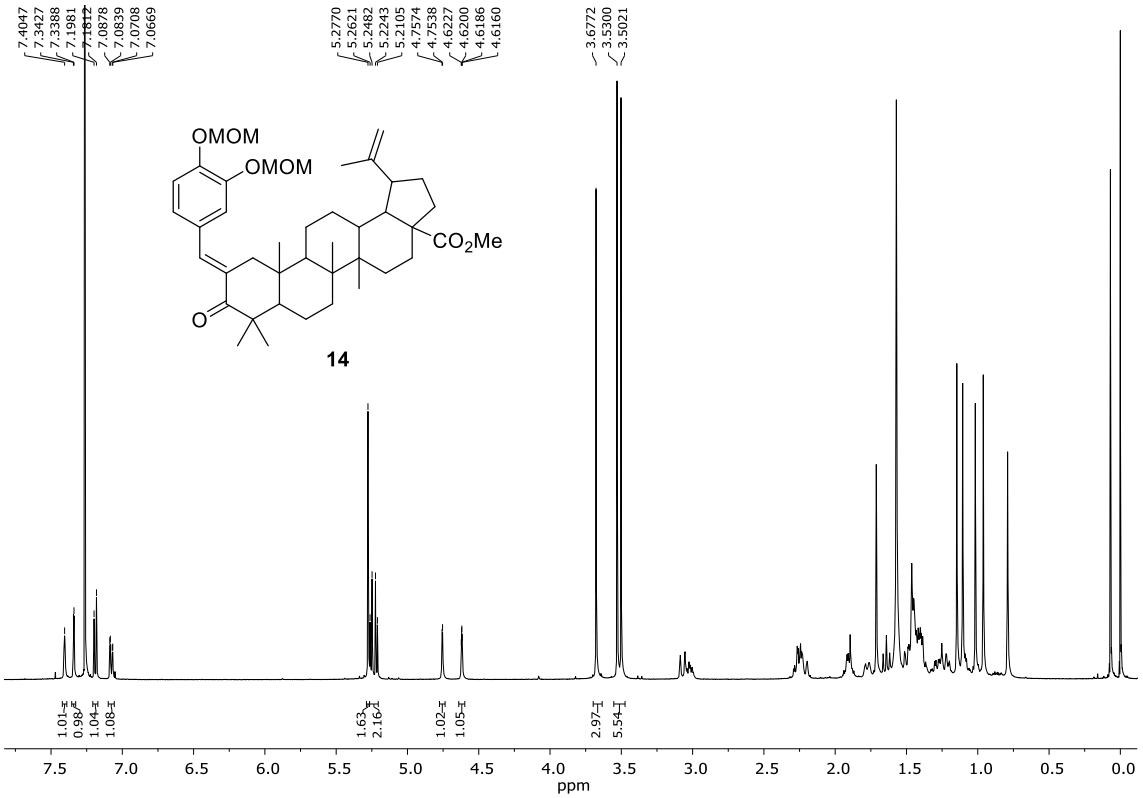

Figure S12. ^{1}H NMR spectrum of methyl (*E*)-2-[3,4-bis(methoxymethoxy)benzylidene]betulonate (**14**) (500.13 MHz, $CDCl_3$).

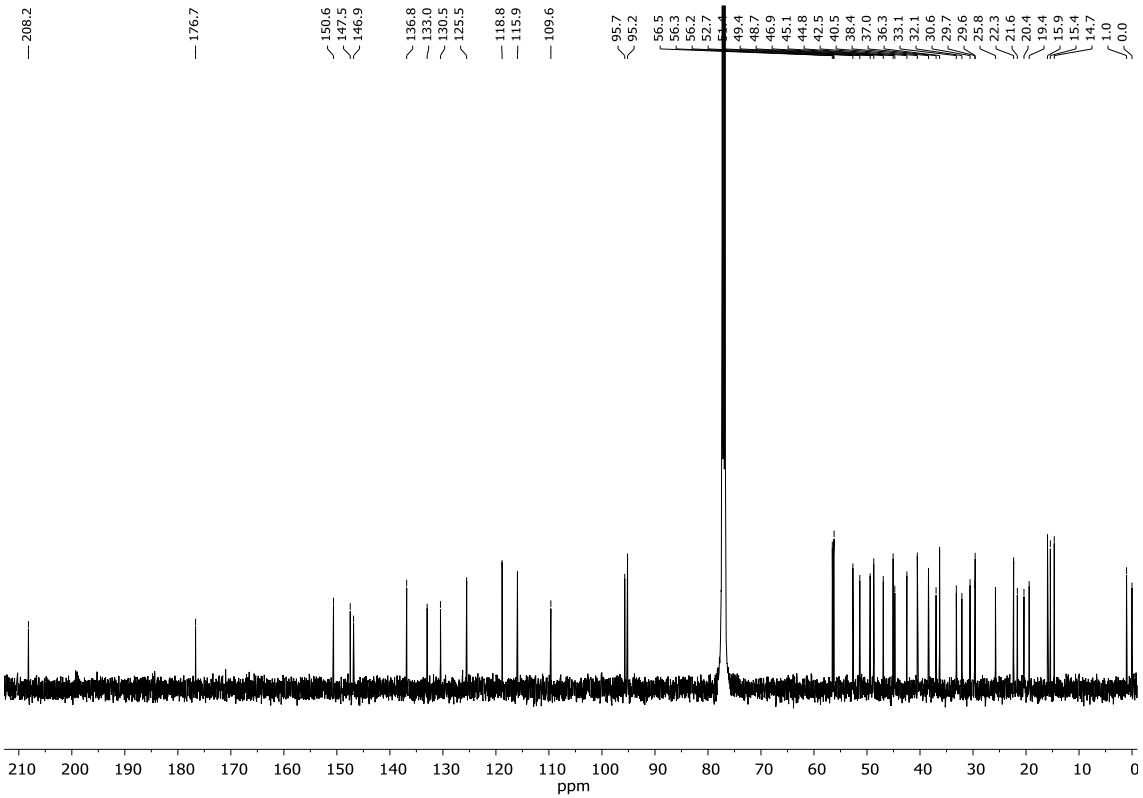

Figure S13. ^{13}C NMR spectrum of methyl (*E*)-2-[3,4-bis(methoxymethoxy)benzylidene]betulonate (**14**) (125.77 MHz, $CDCl_3$).

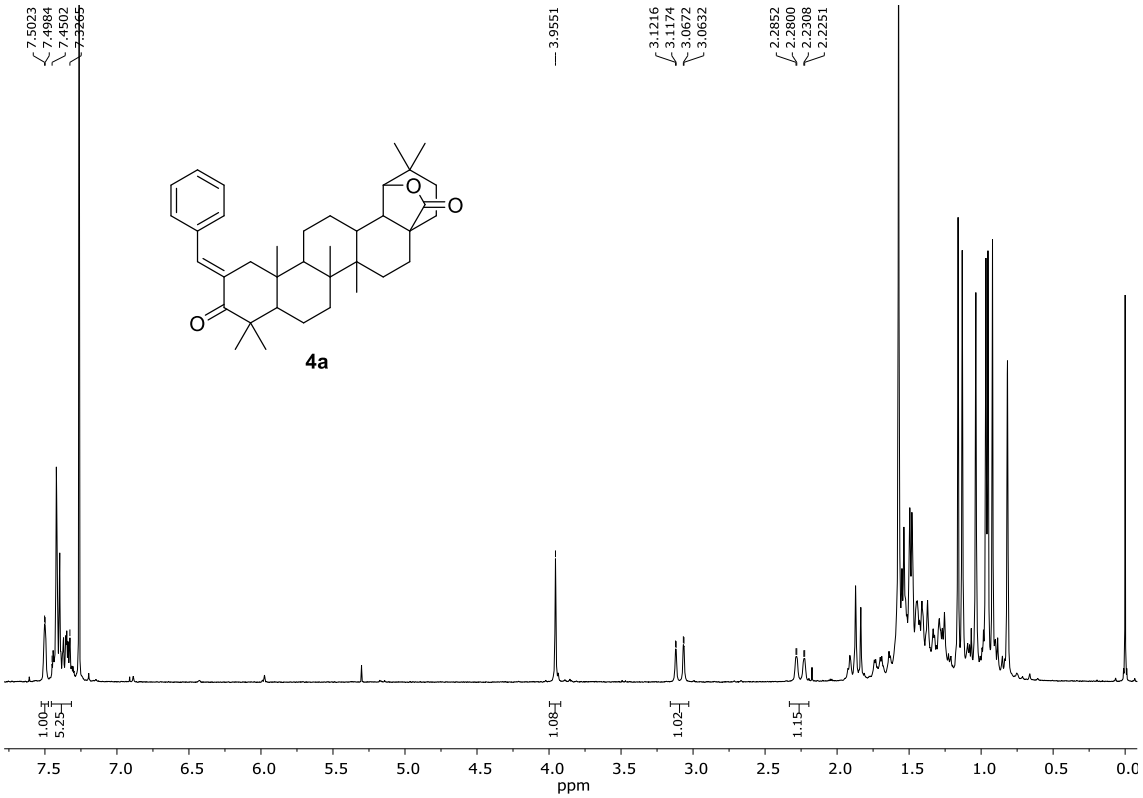

Figure S14. ^{1}H NMR spectrum of (*E*)-2-benzylidene-19,28-epoxyoleanane-3,28-dione (**4a**) (300.13 MHz, $CDCl_3$).

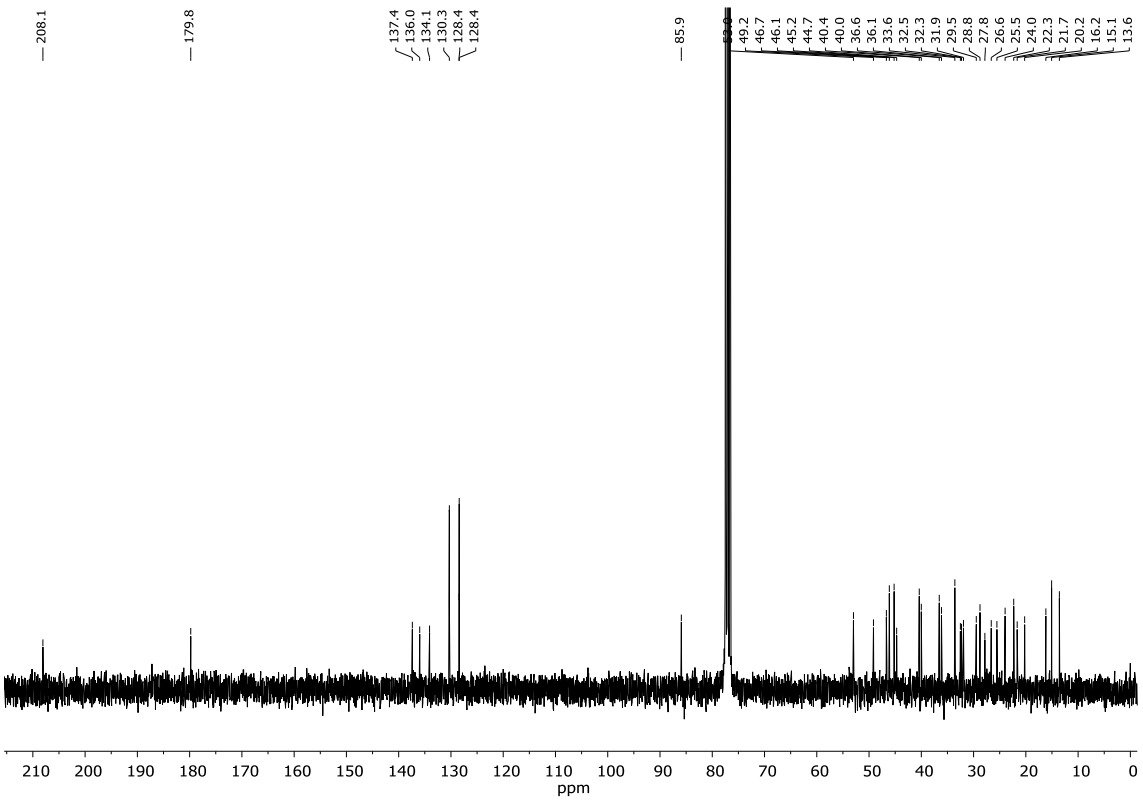

Figure S15. ^{13}C NMR spectrum of (*E*)-2-benzylidene-19,28-epoxyoleanane-3,28-dione (**4a**) (75.47 MHz, $CDCl_3$).

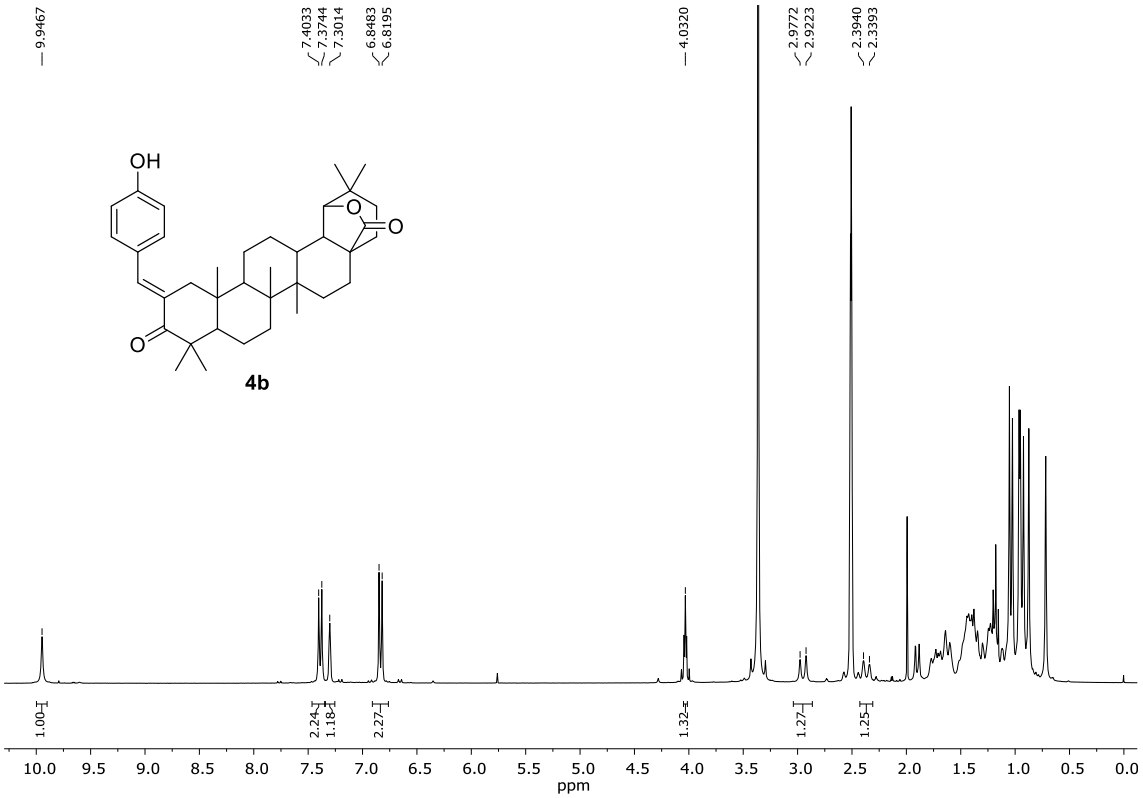

Figure S16. ^{1}H NMR spectrum of (*E*)-2-(4-hydroxybenzylidene)-19,28-epoxyoleanane-3,28-dione (**4b**) (300.13 MHz, DMSO-d_6).

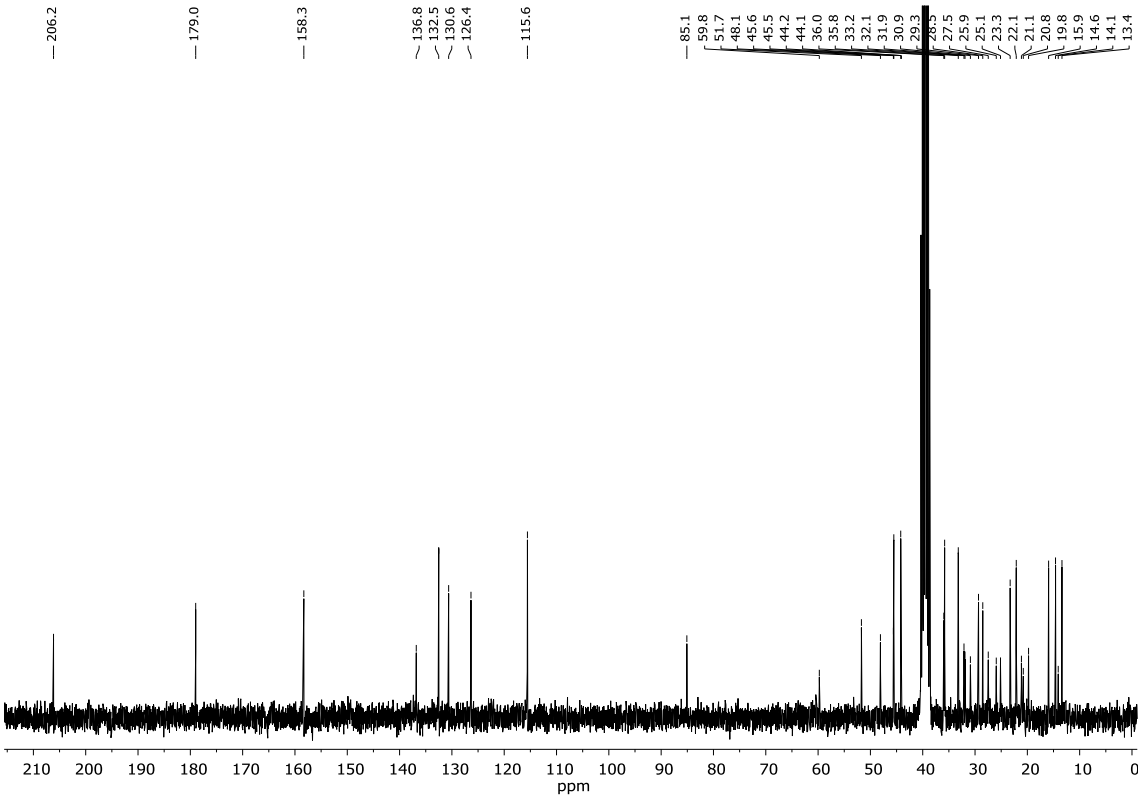

Figure S17. ^{13}C NMR spectrum of (*E*)-2-(4-hydroxybenzylidene)-19,28-epoxyoleanane-3,28-dione (**4b**) (75.47 MHz, DMSO-d_6).

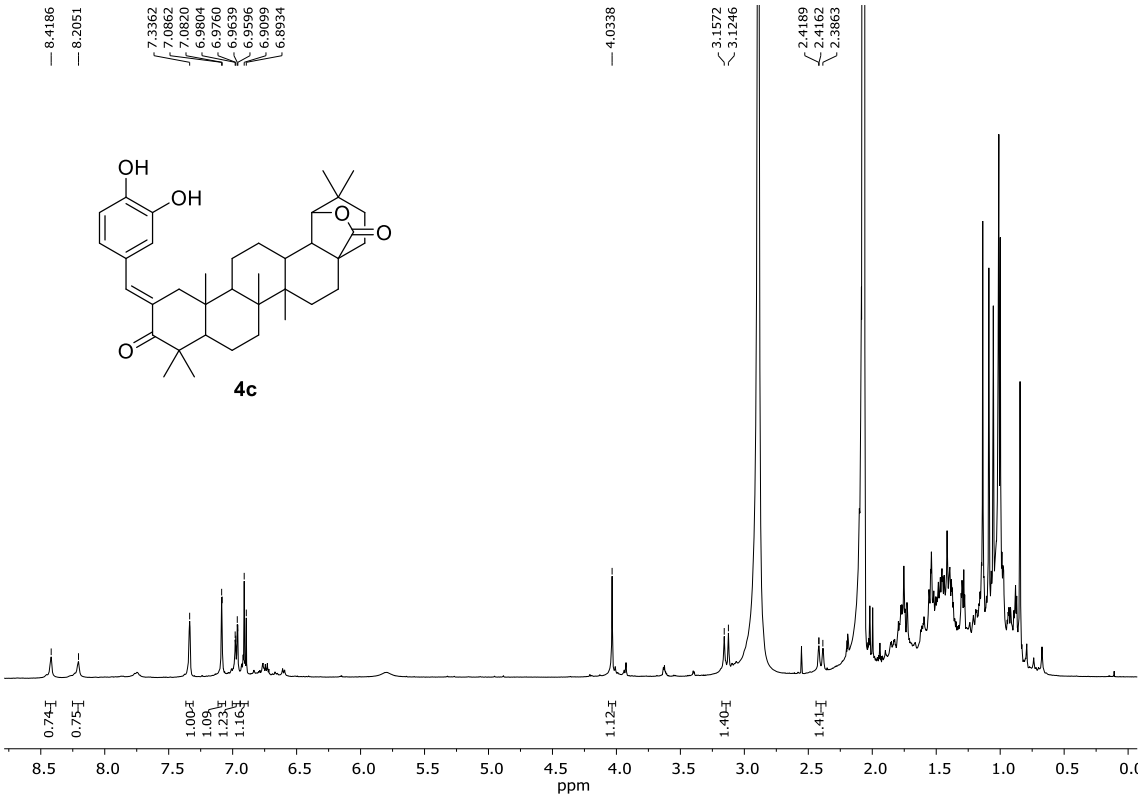

Figure S18. ^{1}H NMR spectrum of (*E*)-2-(3,4-dihydroxybenzylidene)-19,28-epoxyoleanane-3,28-dione (**4c**) (500.13 MHz, Acetone-d_6).

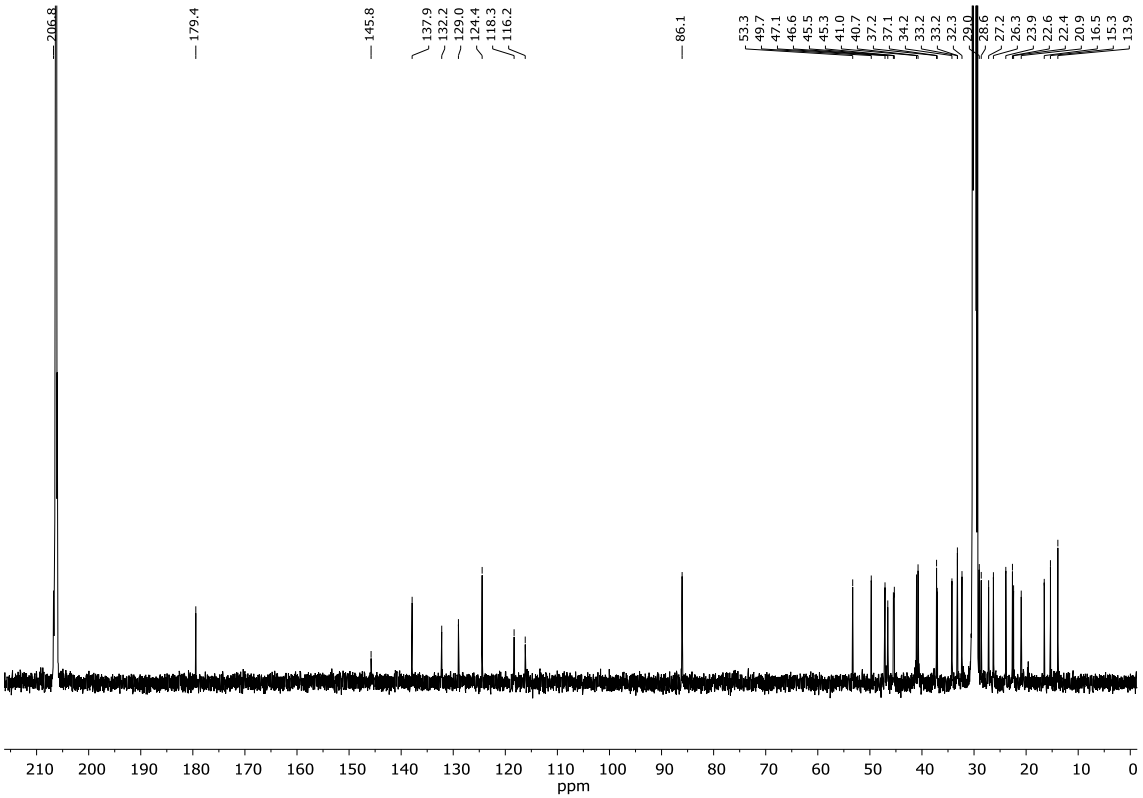

Figure S19. ^{13}C NMR spectrum of (*E*)-2-(3,4-dihydroxybenzylidene)-19,28-epoxyoleanane-3,28-dione (**4c**) (125.77 MHz, Acetone-d_6).

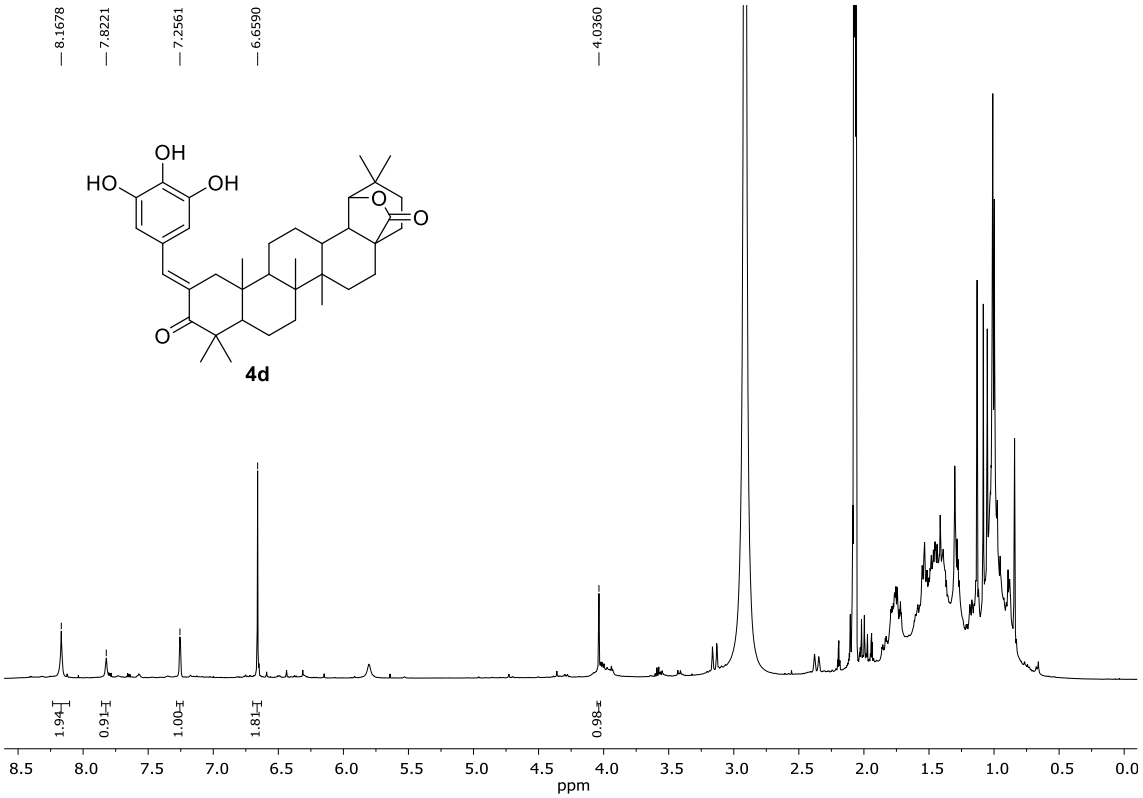

Figure S20. ^{1}H NMR spectrum of (*E*)-2-(3,4,5-trihydroxybenzylidene)-19,28-epoxyoleanane-3,28-dione (**4d**) (500.13 MHz, Acetone-d_6).

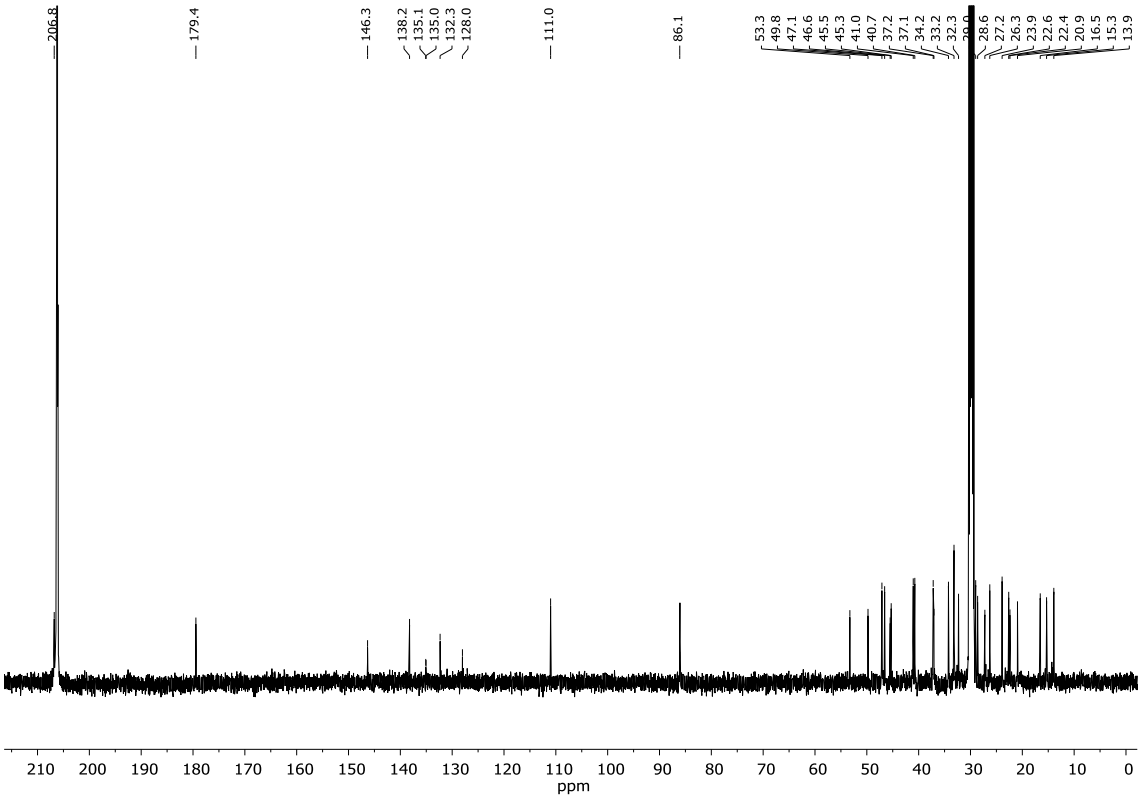

Figure S21. ^{13}C NMR spectrum of (*E*)-2-(3,4,5-trihydroxybenzylidene)-19,28-epoxyoleanane-3,28-dione (**4d**) (125.77 MHz, Acetone-d_6).

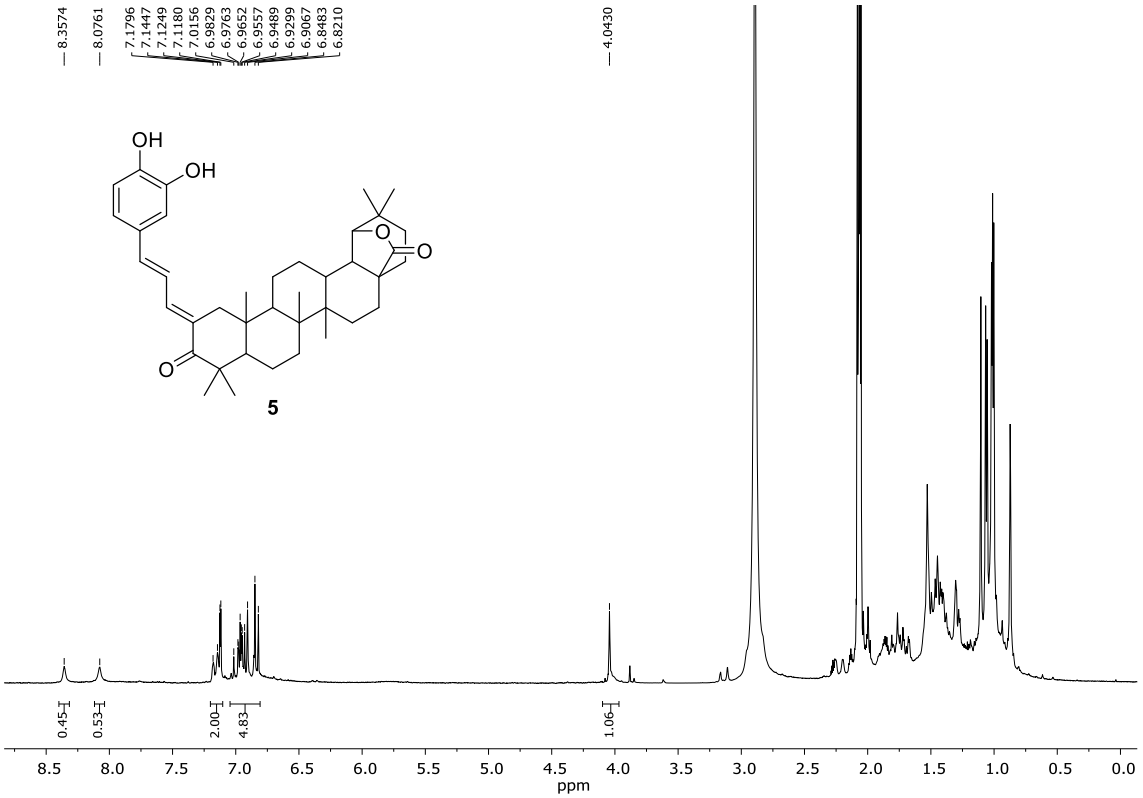

Figure S22. ^{1}H NMR spectrum of (*E*,*E*)-2-[3-(3,4-dihydroxyphenyl)allylidene]-19,28-epoxyoleanane-3,28-dione (**5**) (300.13 MHz, Acetone-d_6).

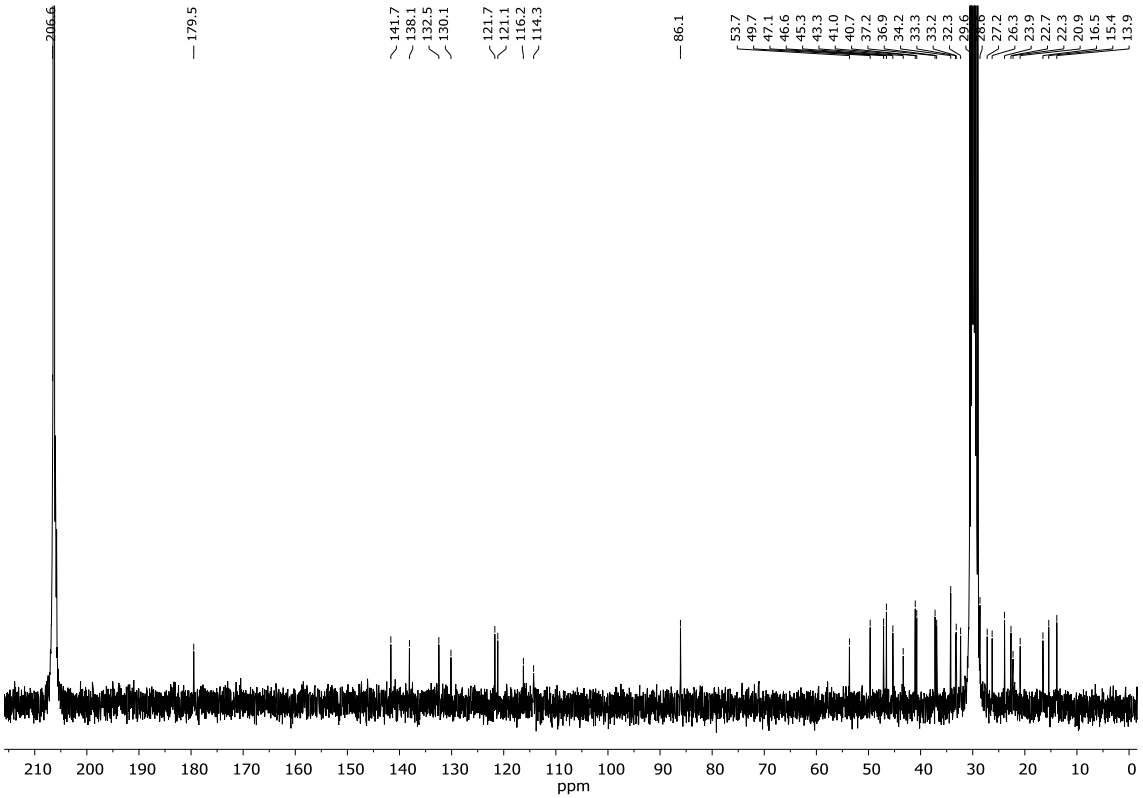

Figure S23. ^{13}C NMR spectrum of (*E*,*E*)-2-[3-(3,4-dihydroxyphenyl)allylidene]-19,28-epoxyoleanane-3,28-dione (**5**) (75.47 MHz, Acetone-d_6).

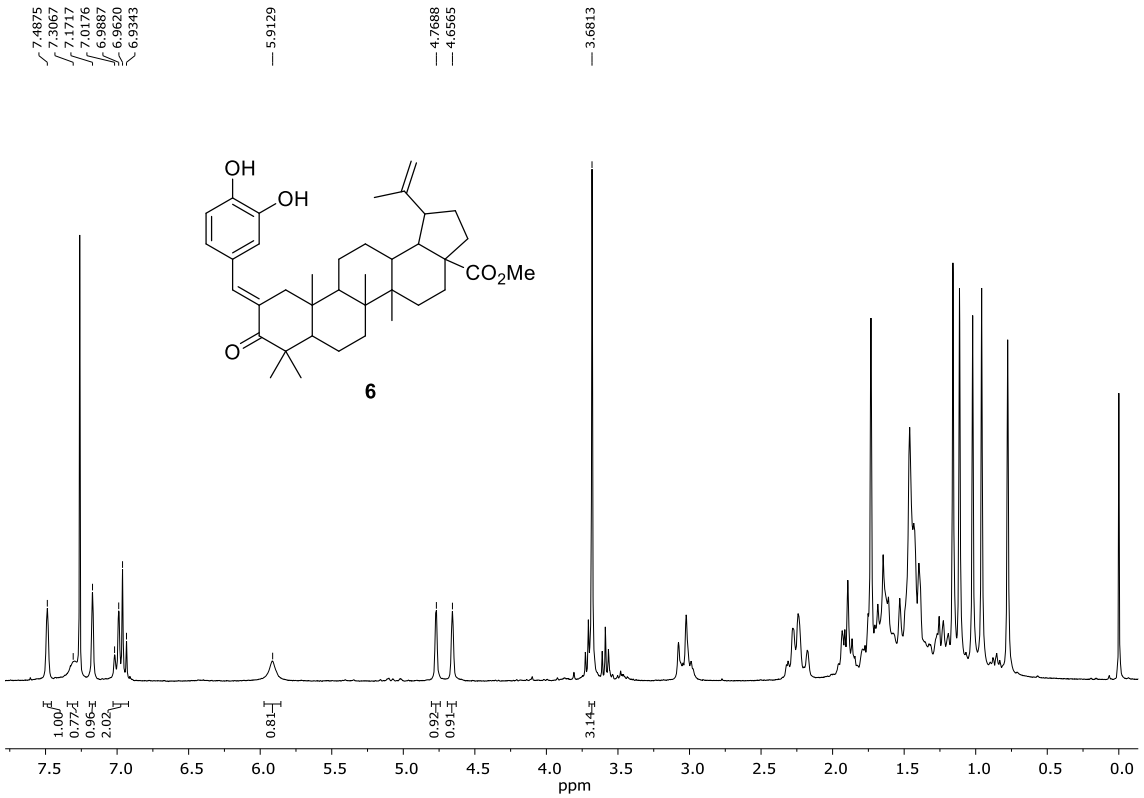

Figure S24. ^{1}H NMR spectrum of methyl (*E*)-2-(3,4-dihydroxybenzylidene)betulonate (**6**) (300.13 MHz, $CDCl_3$).

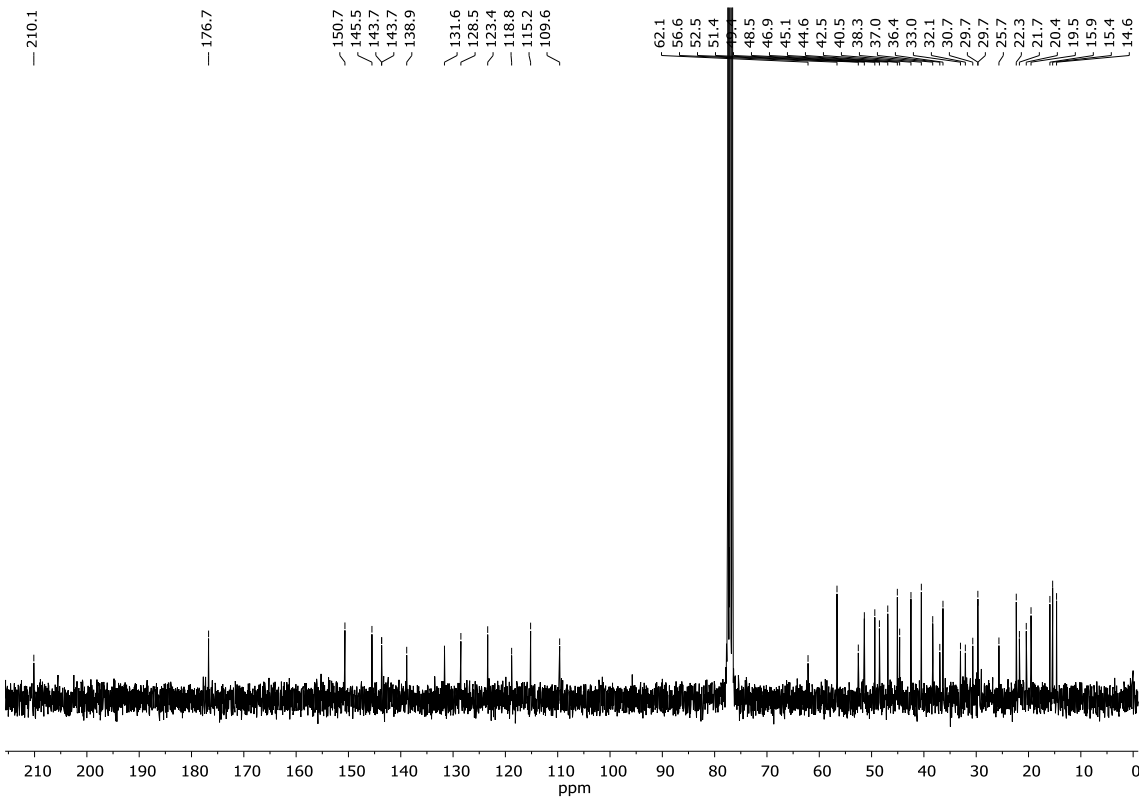

Figure S25. ^{13}C NMR spectrum of methyl (*E*)-2-(3,4-dihydroxybenzylidene)betulonate (**6**) (75.47 MHz, $CDCl_3$).