

REFERENCES

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APPENDIX

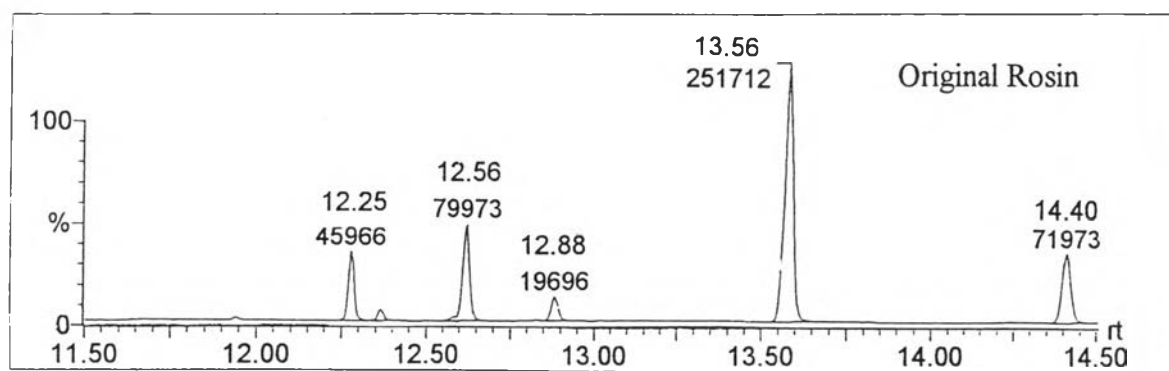


Figure A 1 GC-MS chromatograms of original rosin.

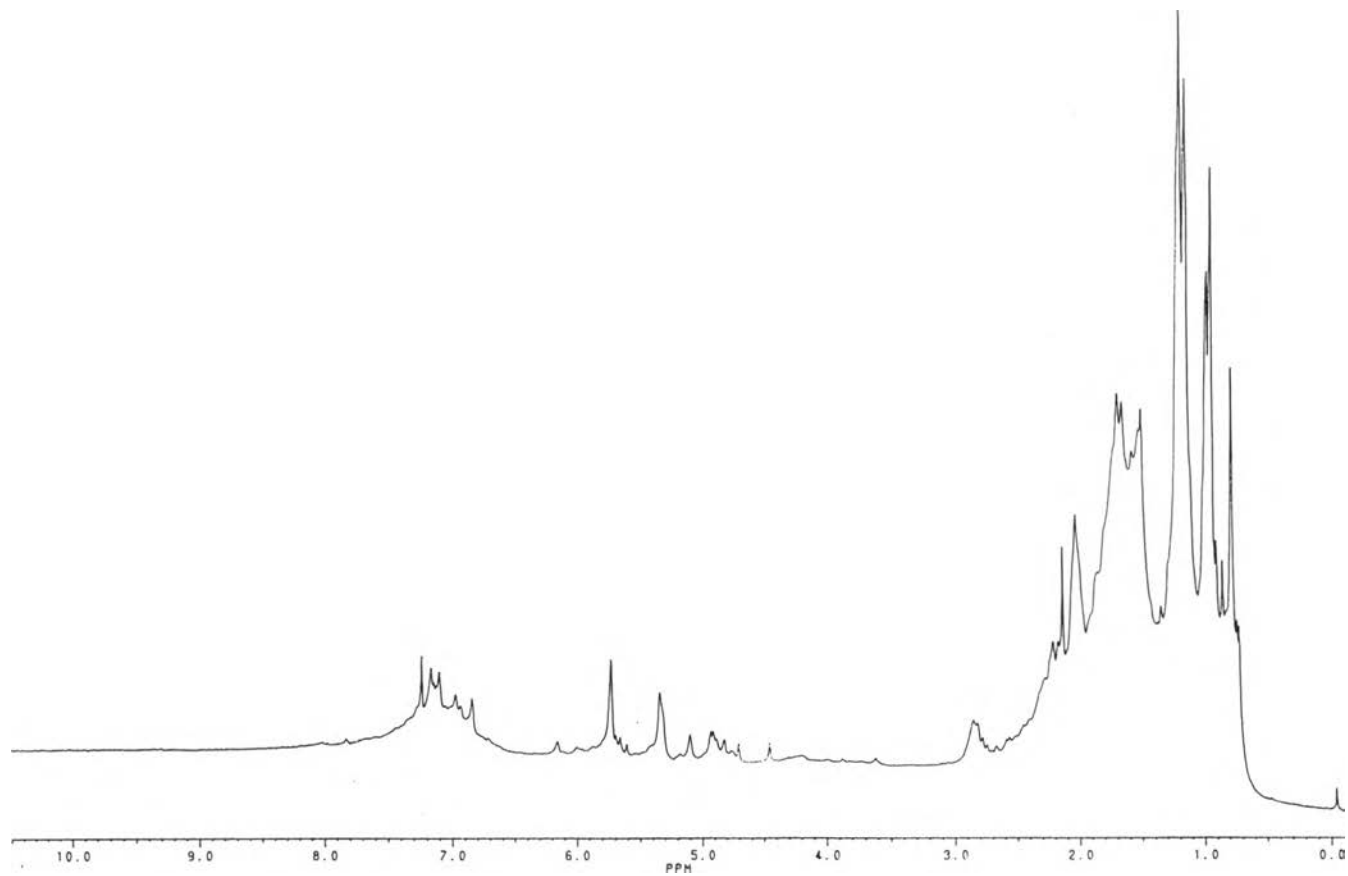


Figure A 2 ^1H -NMR of original rosin.

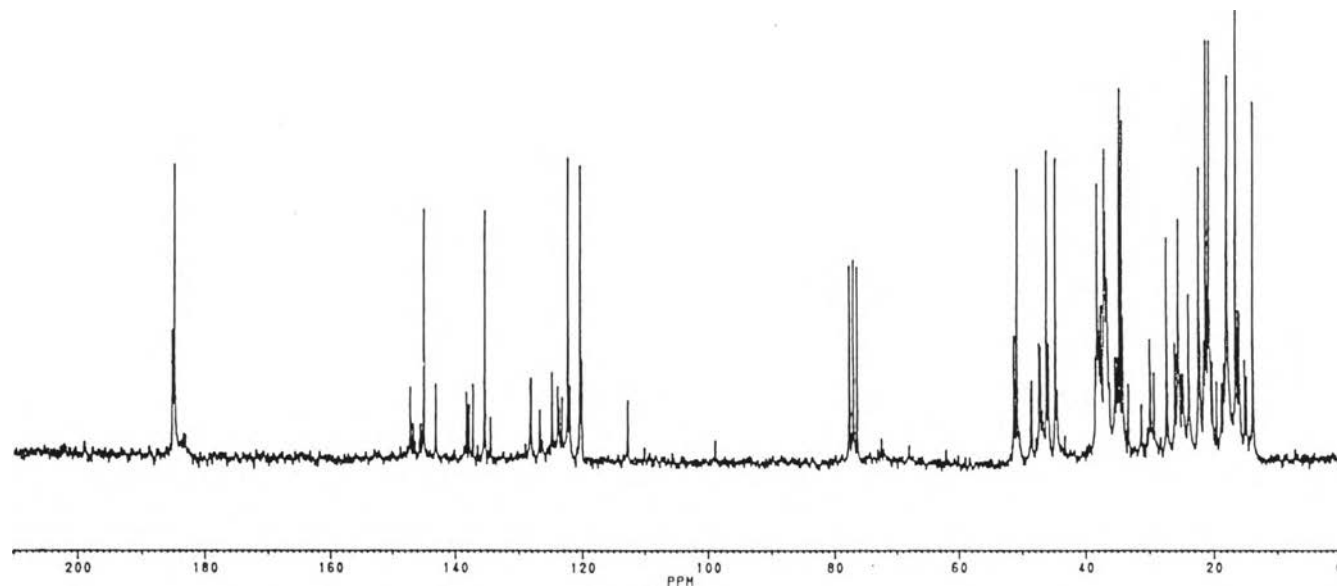


Figure A 3 ^{13}C -NMR of original rosin.

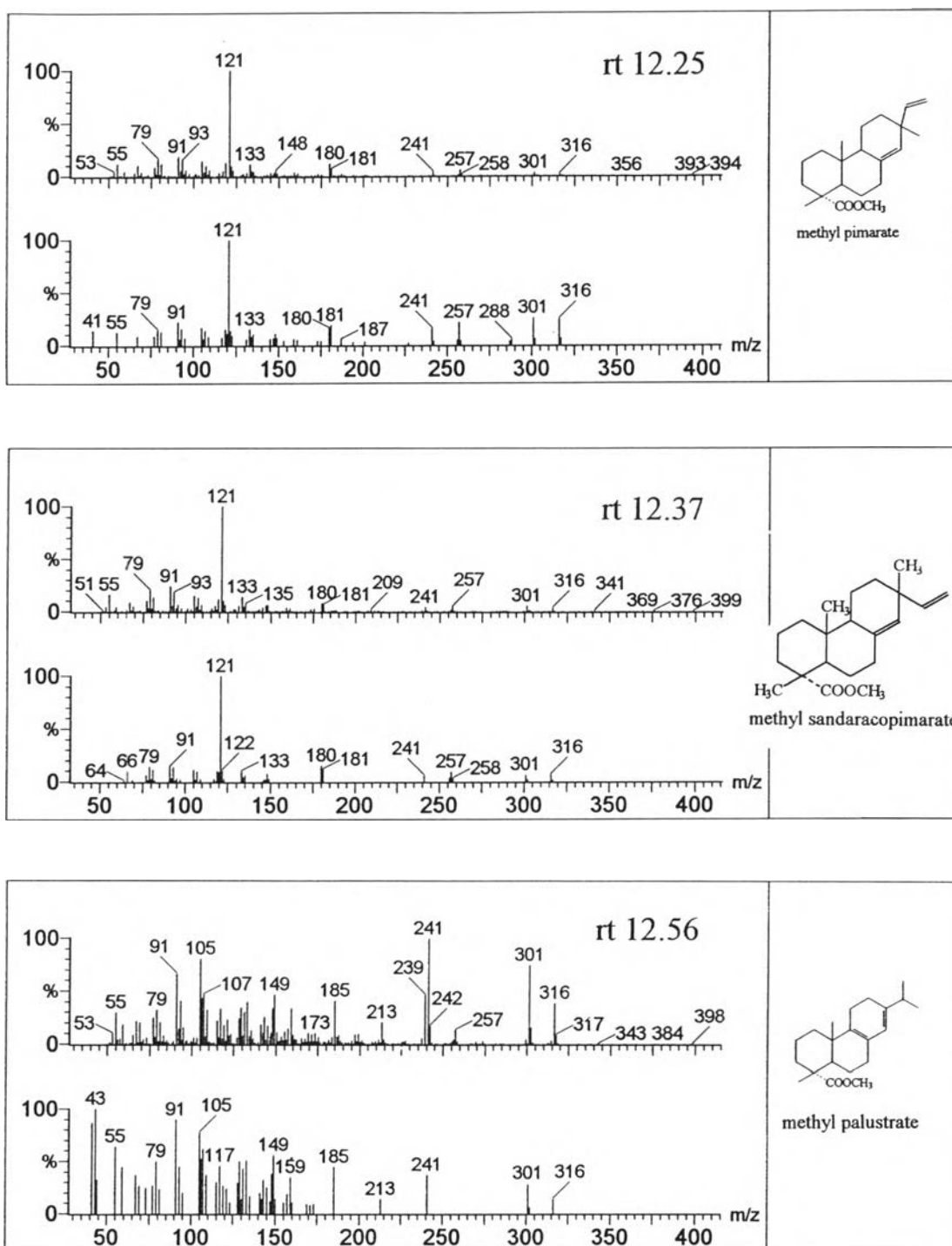


Figure A 4 Mass spectra of original rosin.

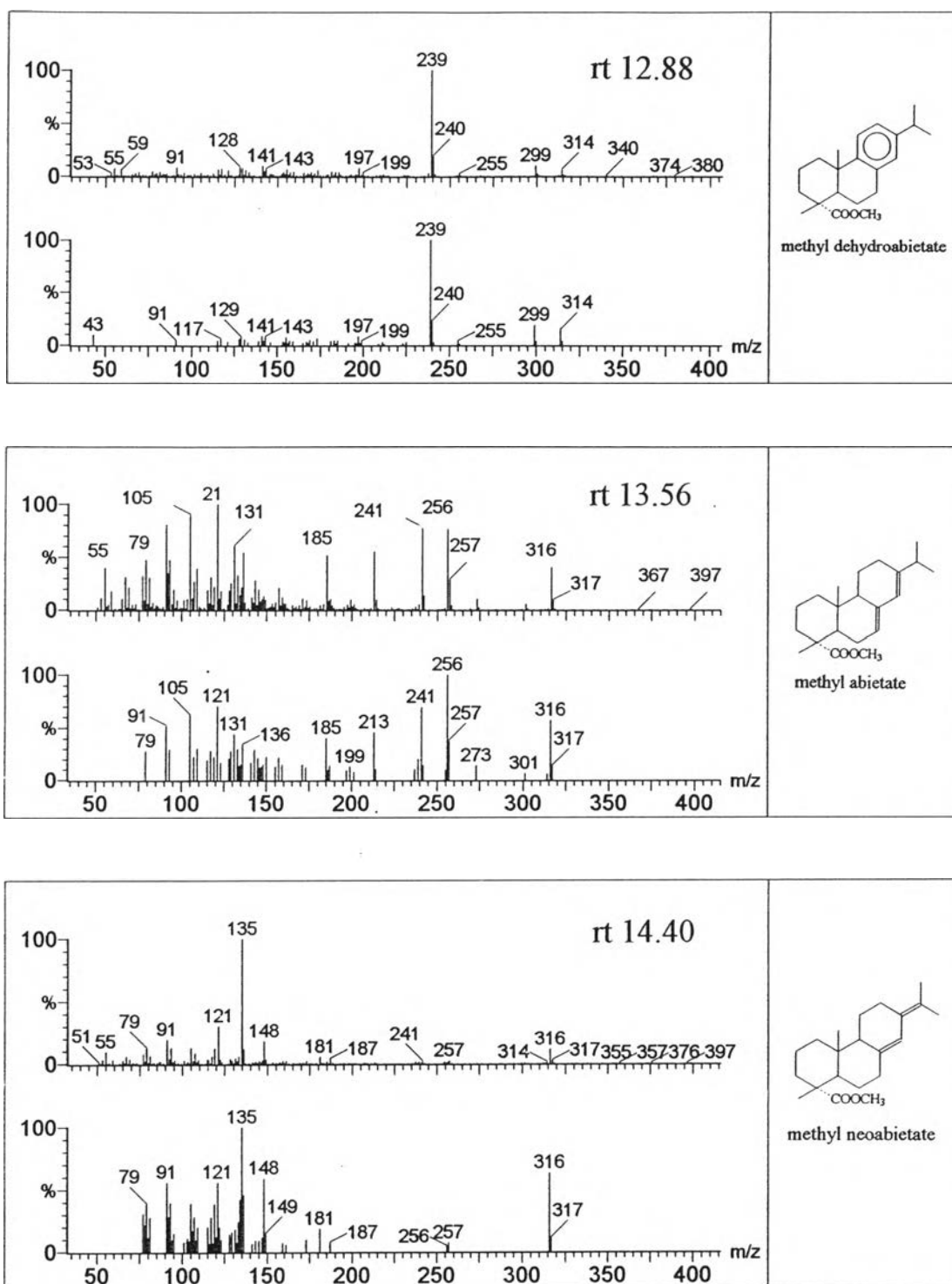


Figure A 4 Mass spectra of original rosin (continued).



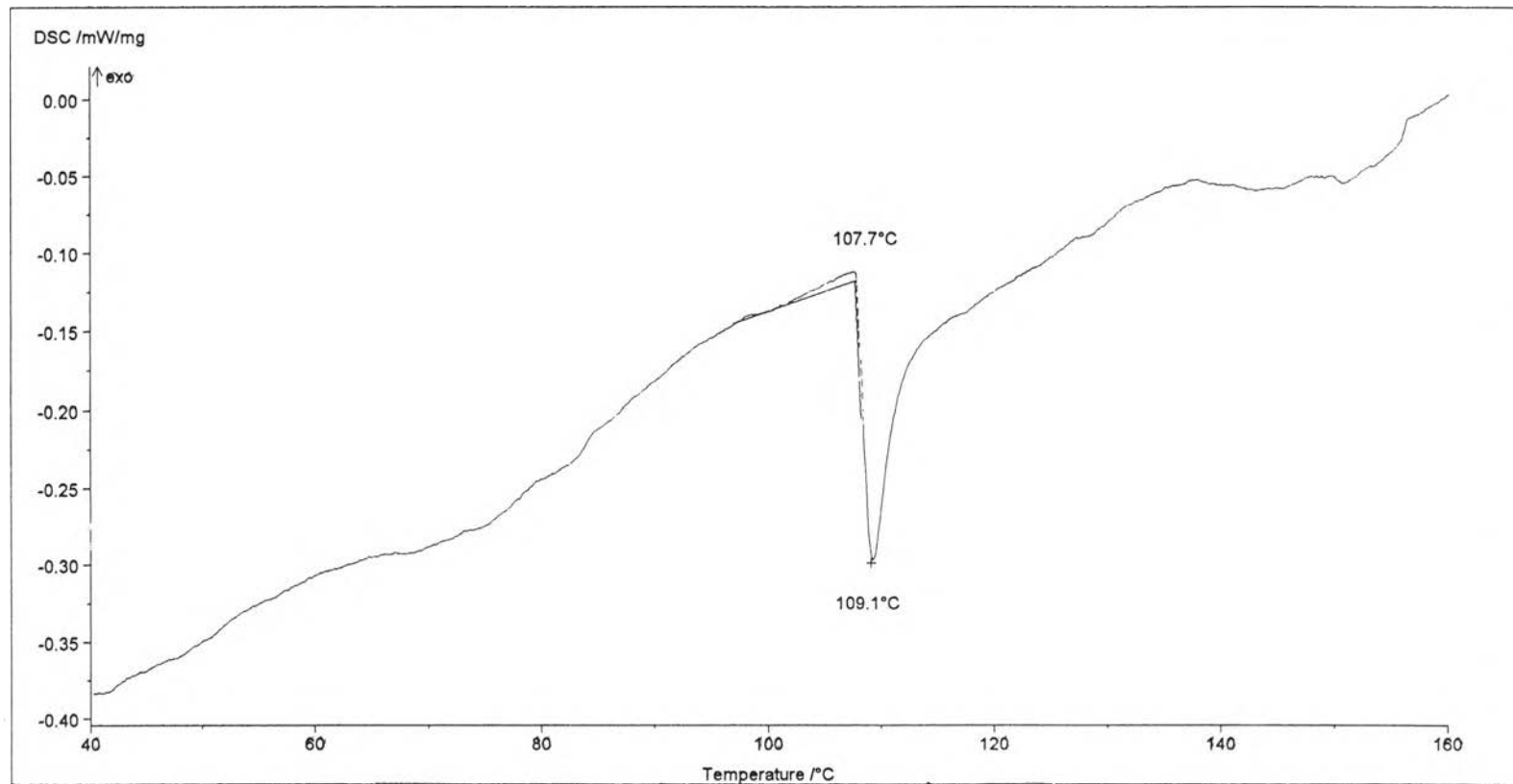


Figure A 5 DSC of original rosin.

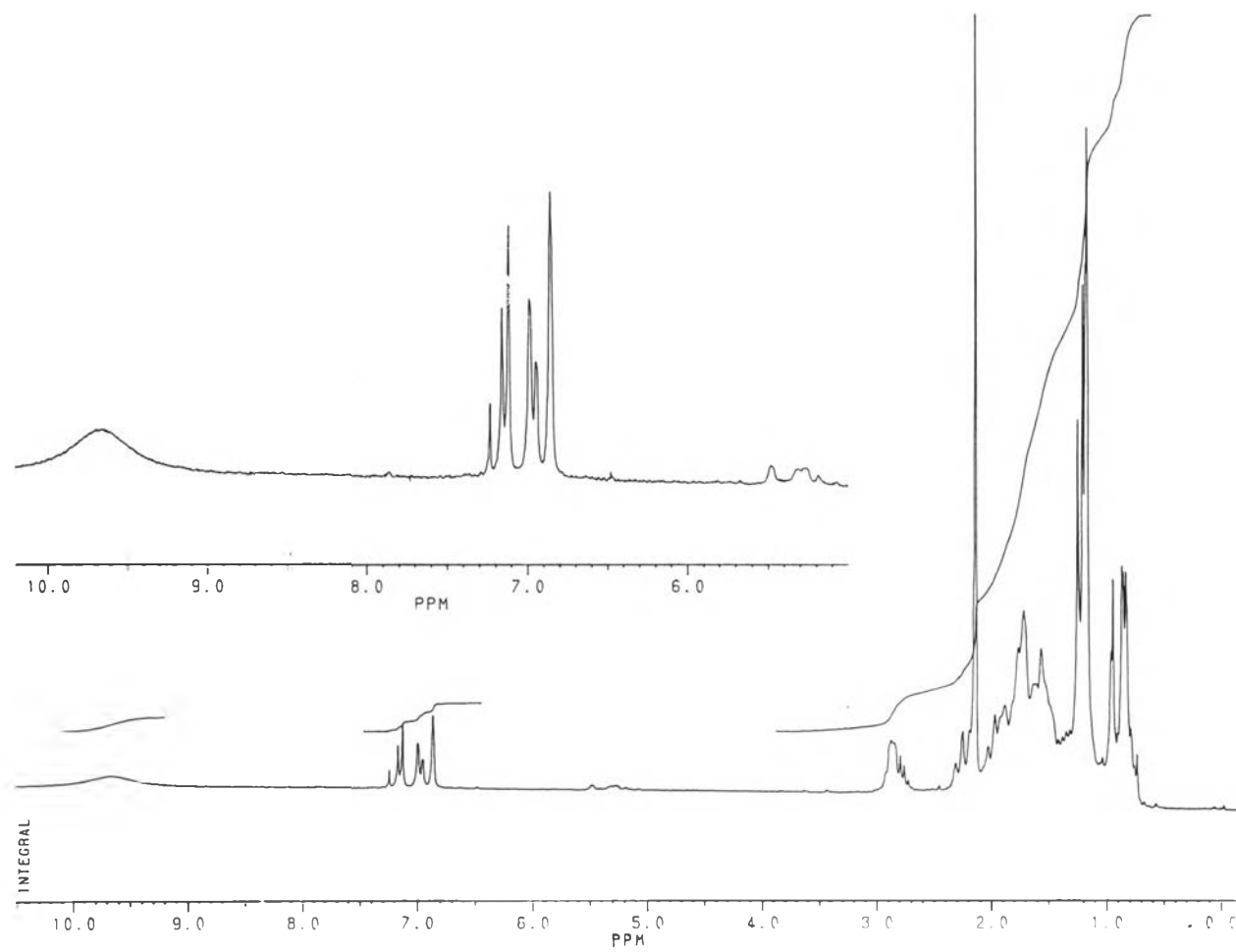


Figure A 6 $^1\text{H-NMR}$ of dehydrogenated rosin.

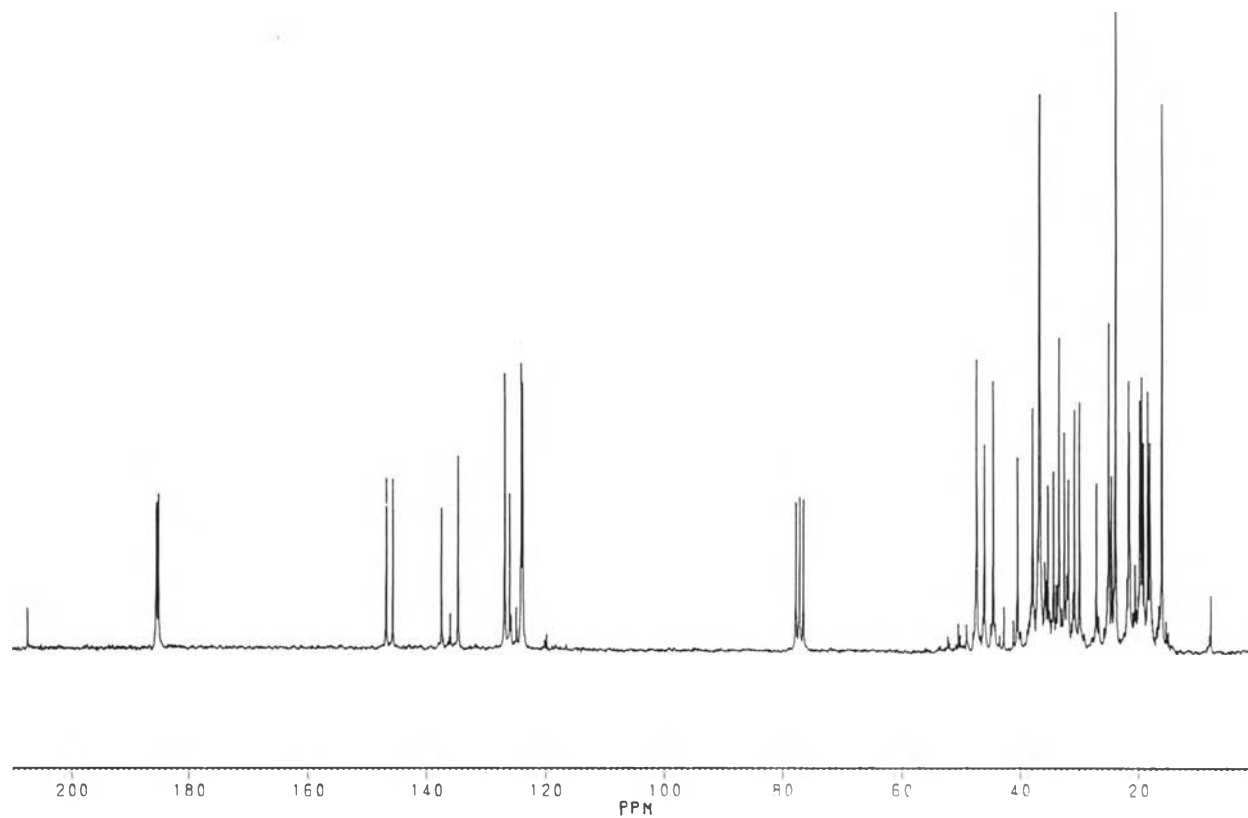


Figure A 7 ^{13}C -NMR of dehydrogenated rosin.

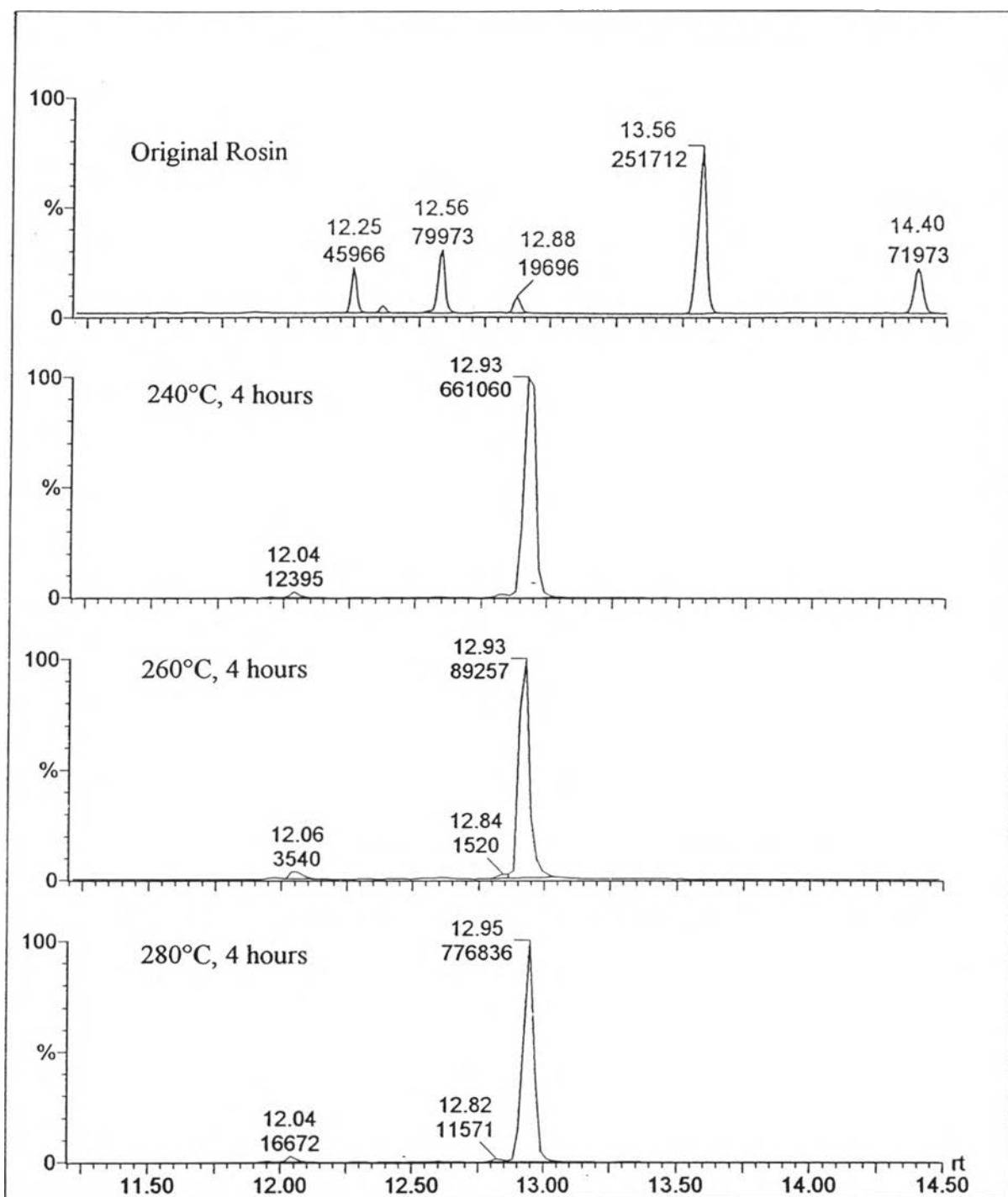


Figure A 8 GC-MS chromatograms of dehydrogenated rosins at various reaction temperatures.

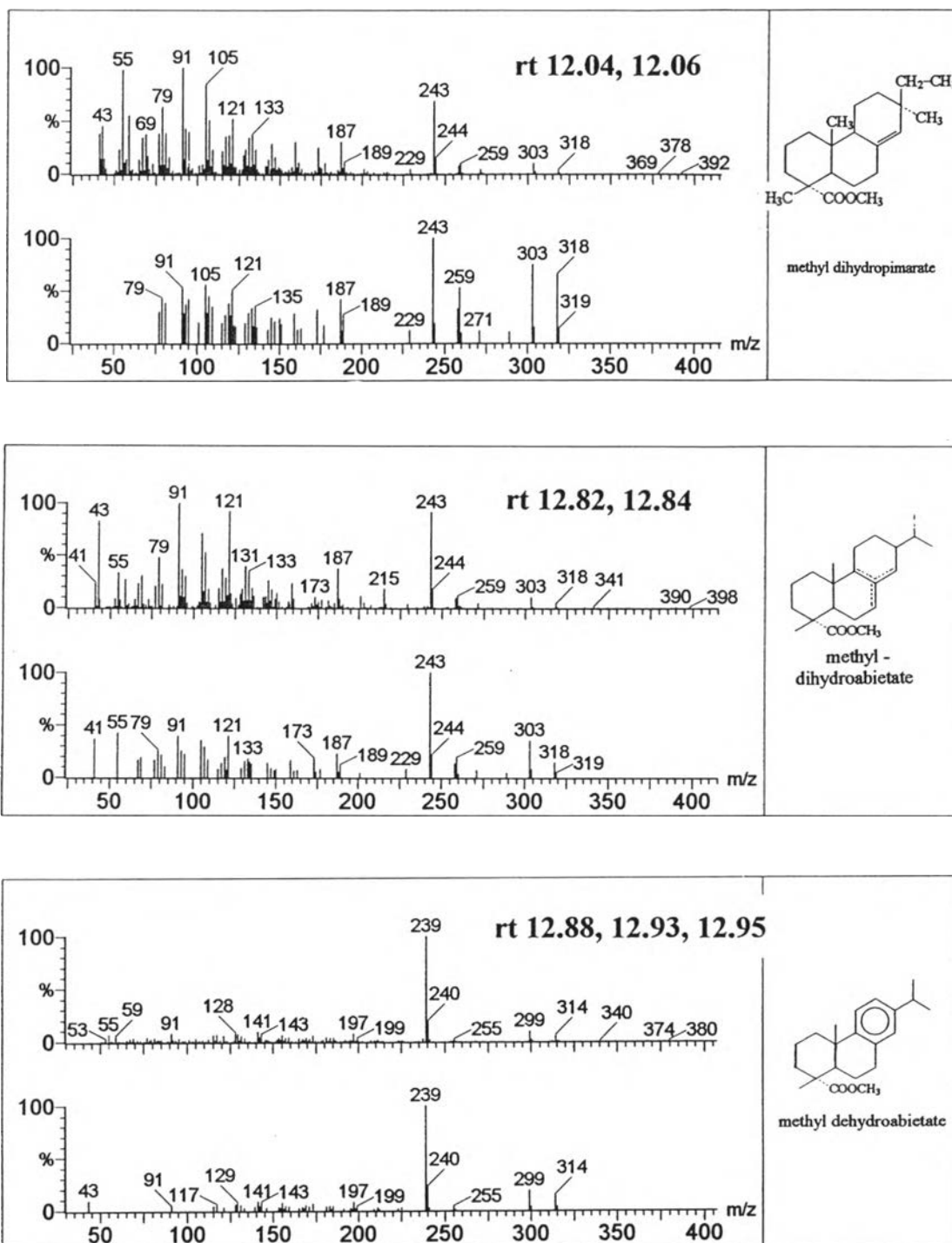


Figure A 9 Mass spectra of dehydrogenated rosin.

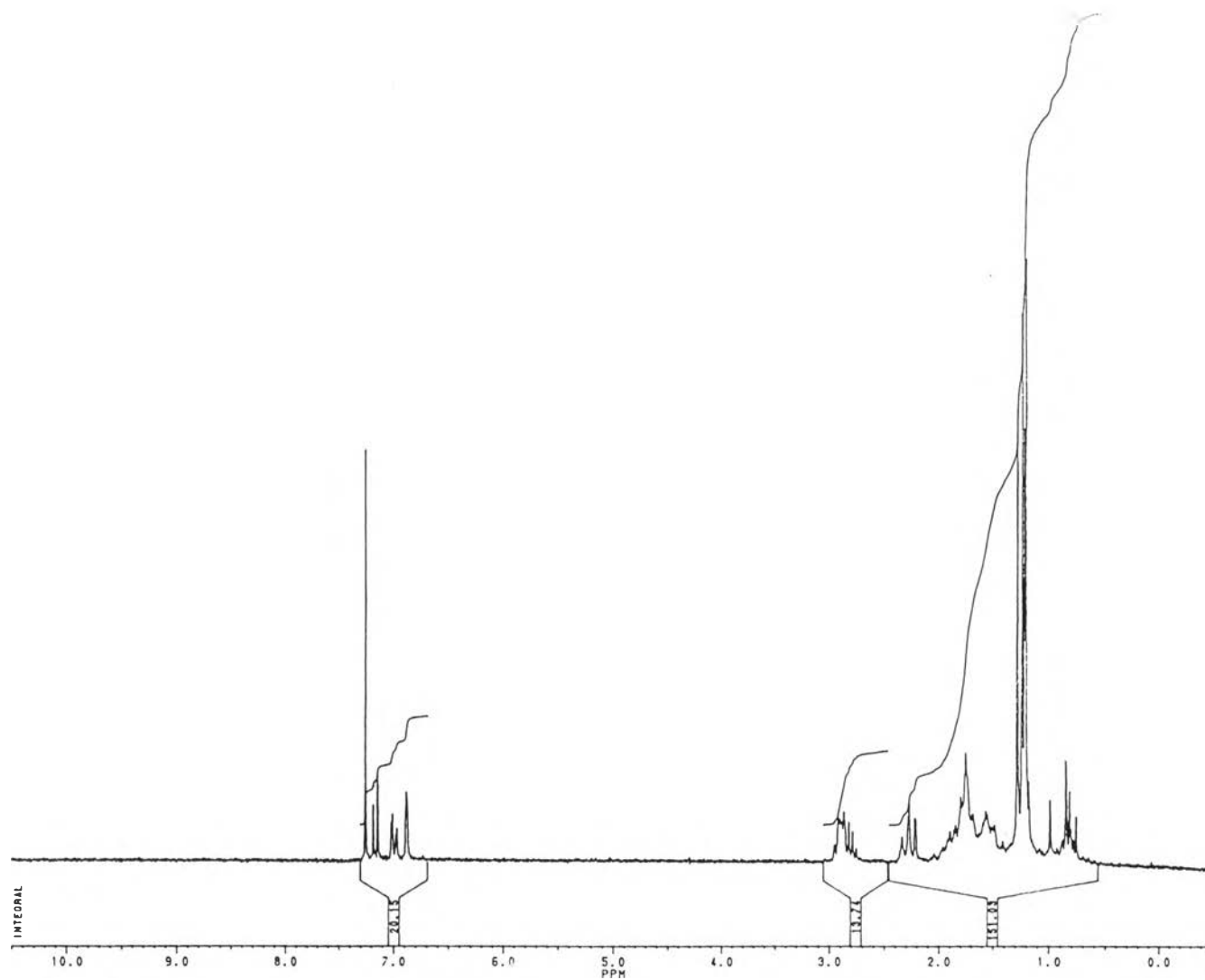


Figure A 10 $^1\text{H-NMR}$ of crystallized dehydrogenated rosin.

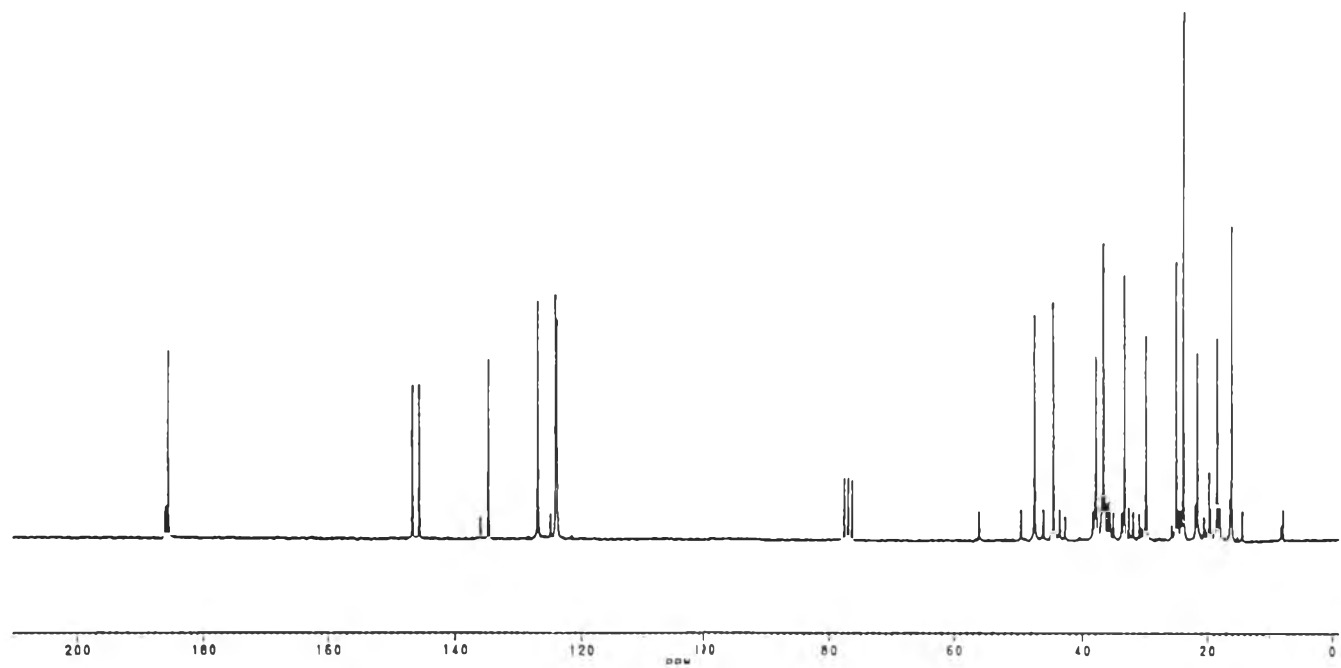


Figure A 11 ^{13}C -NMR of crystallized dehydrogenated rosin.

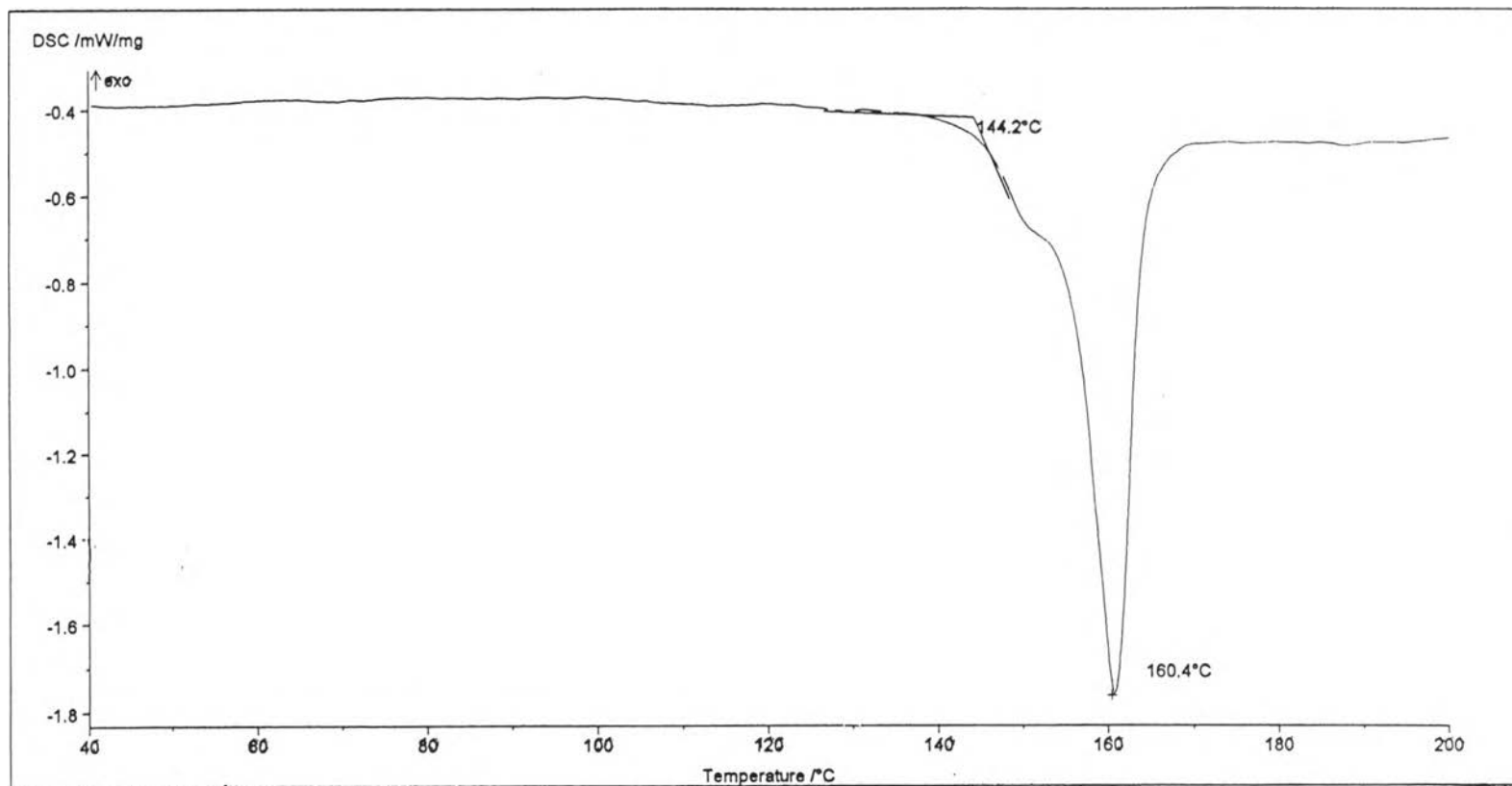


Figure A 12 DSC of crystallized dehydrogenated rosin.

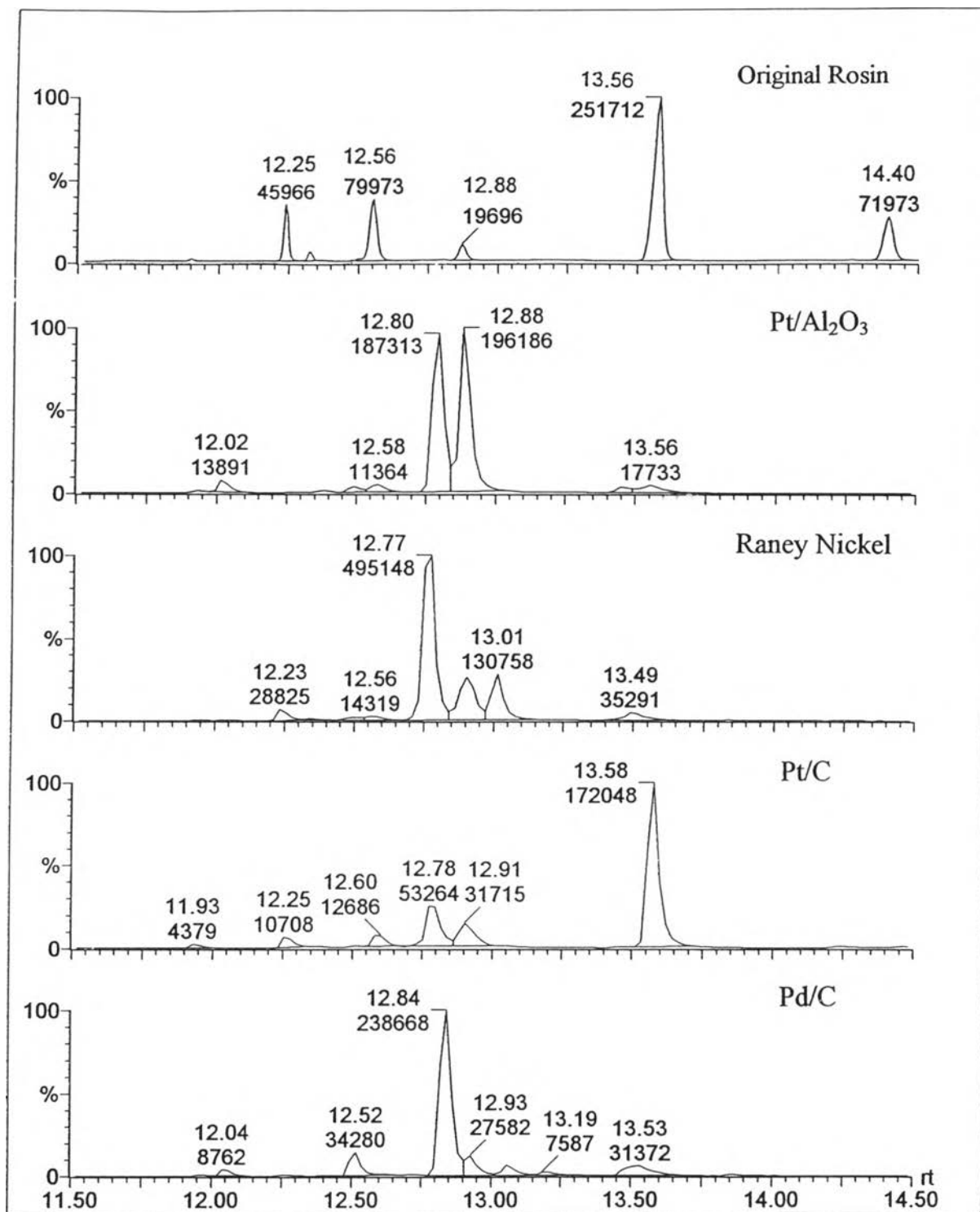


Figure A 13 GC-MS chromatograms of hydrogenated rosins produced with various catalyst types.

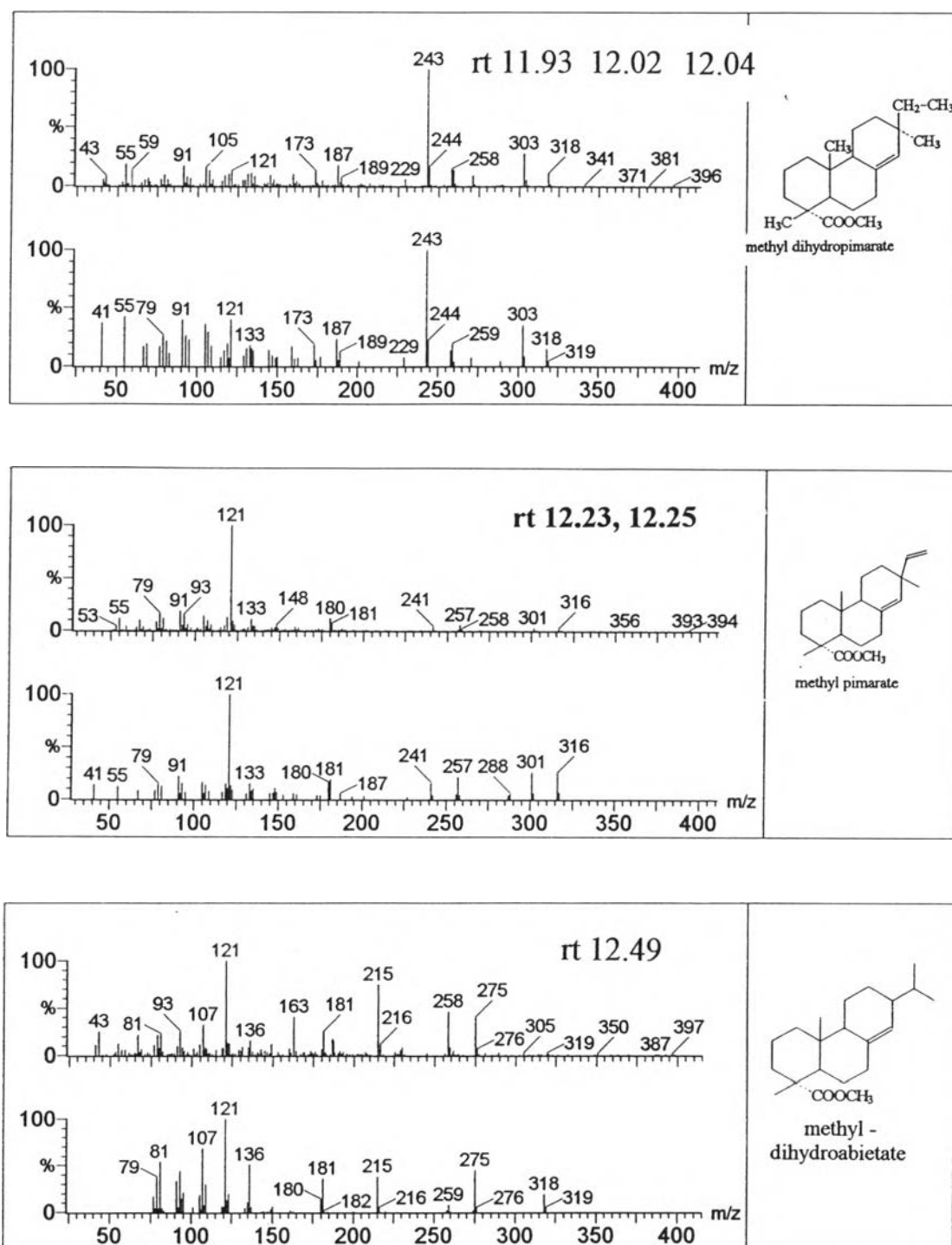


Figure A 14 Mass spectra of hydrogenated rosins produced with various catalyst types.

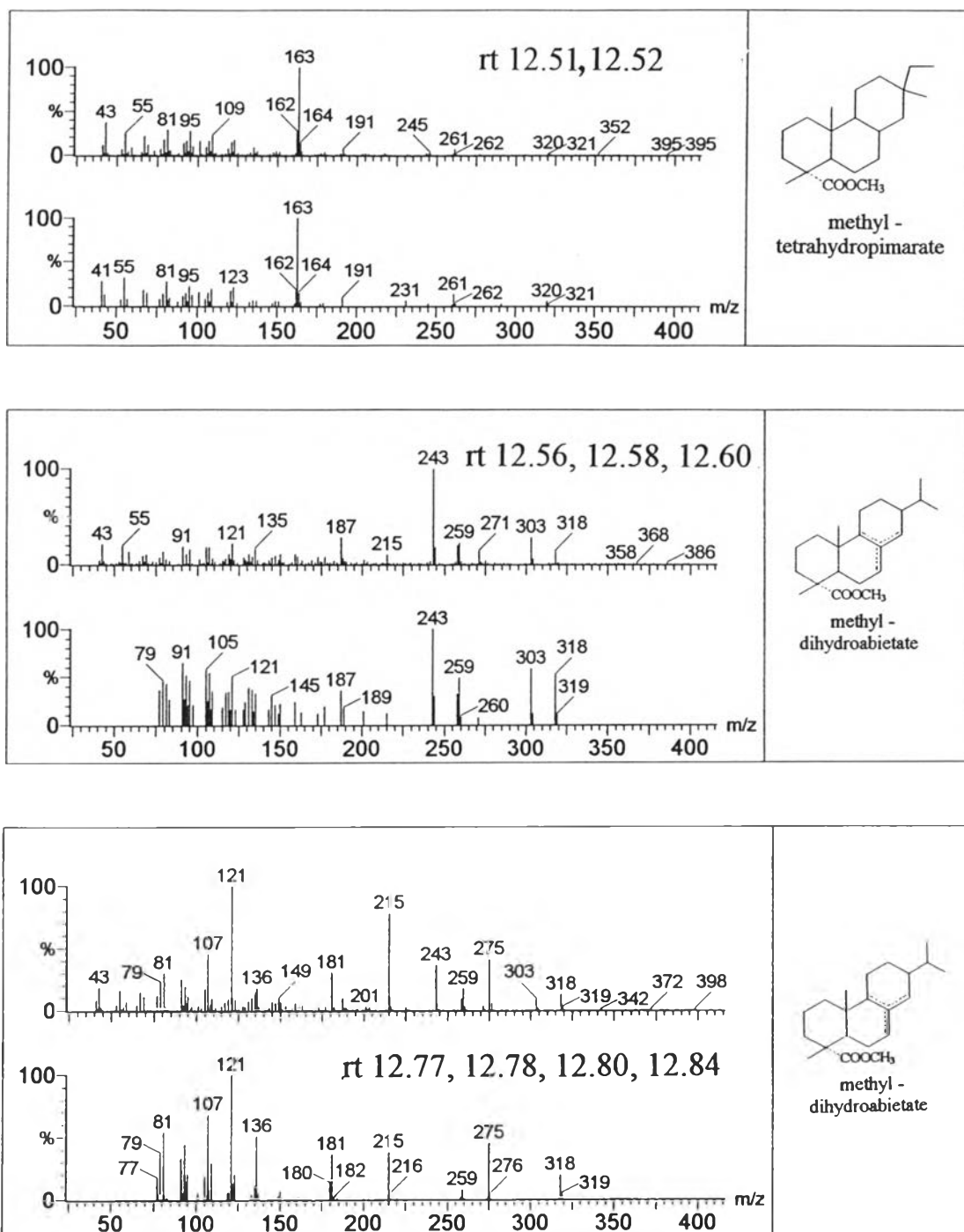


Figure A 14 Mass spectra of hydrogenated rosins produced with various catalyst types. (continued)

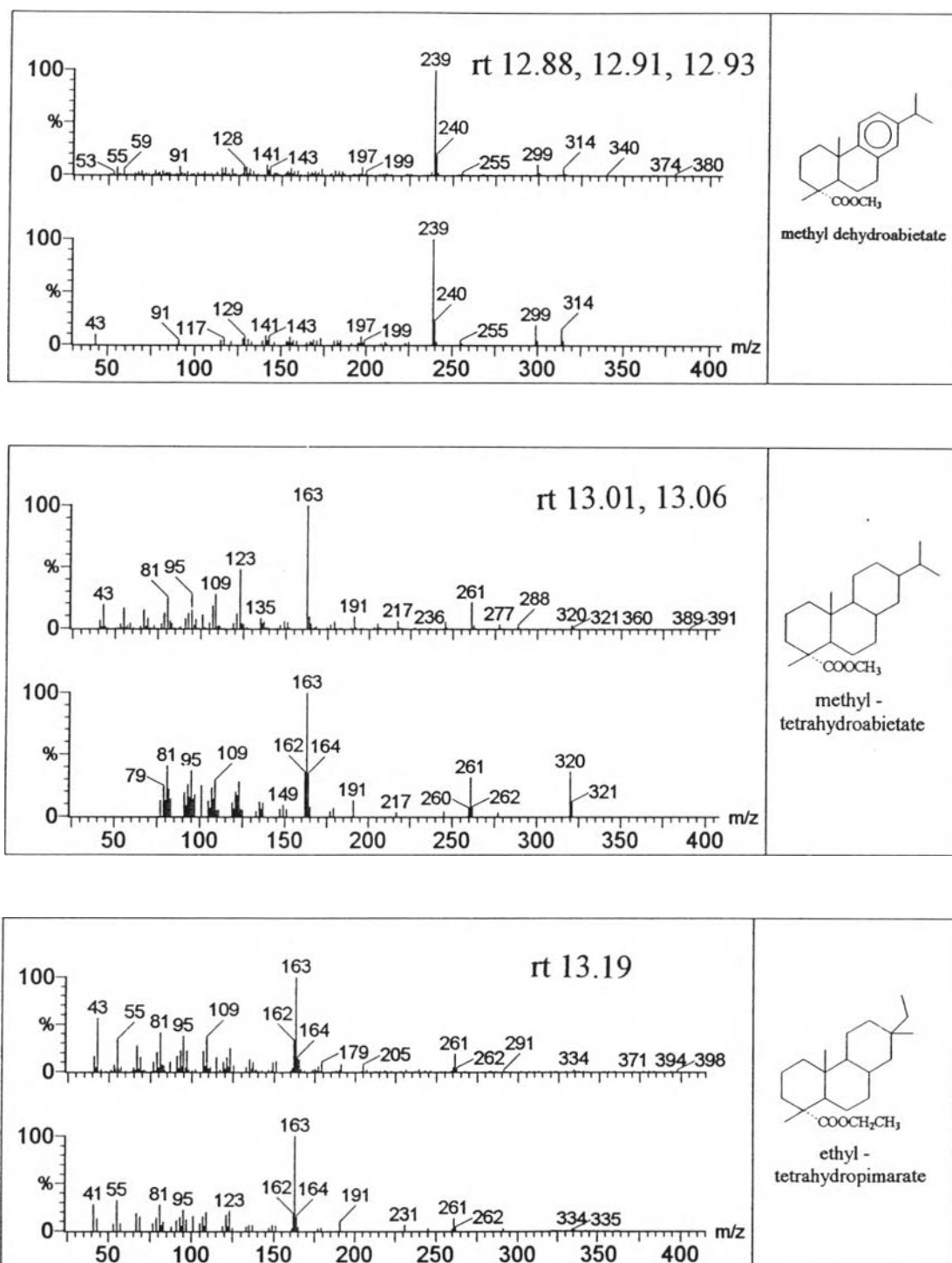


Figure A 14 Mass spectra of hydrogenated rosins produced with various catalyst types. (continued)

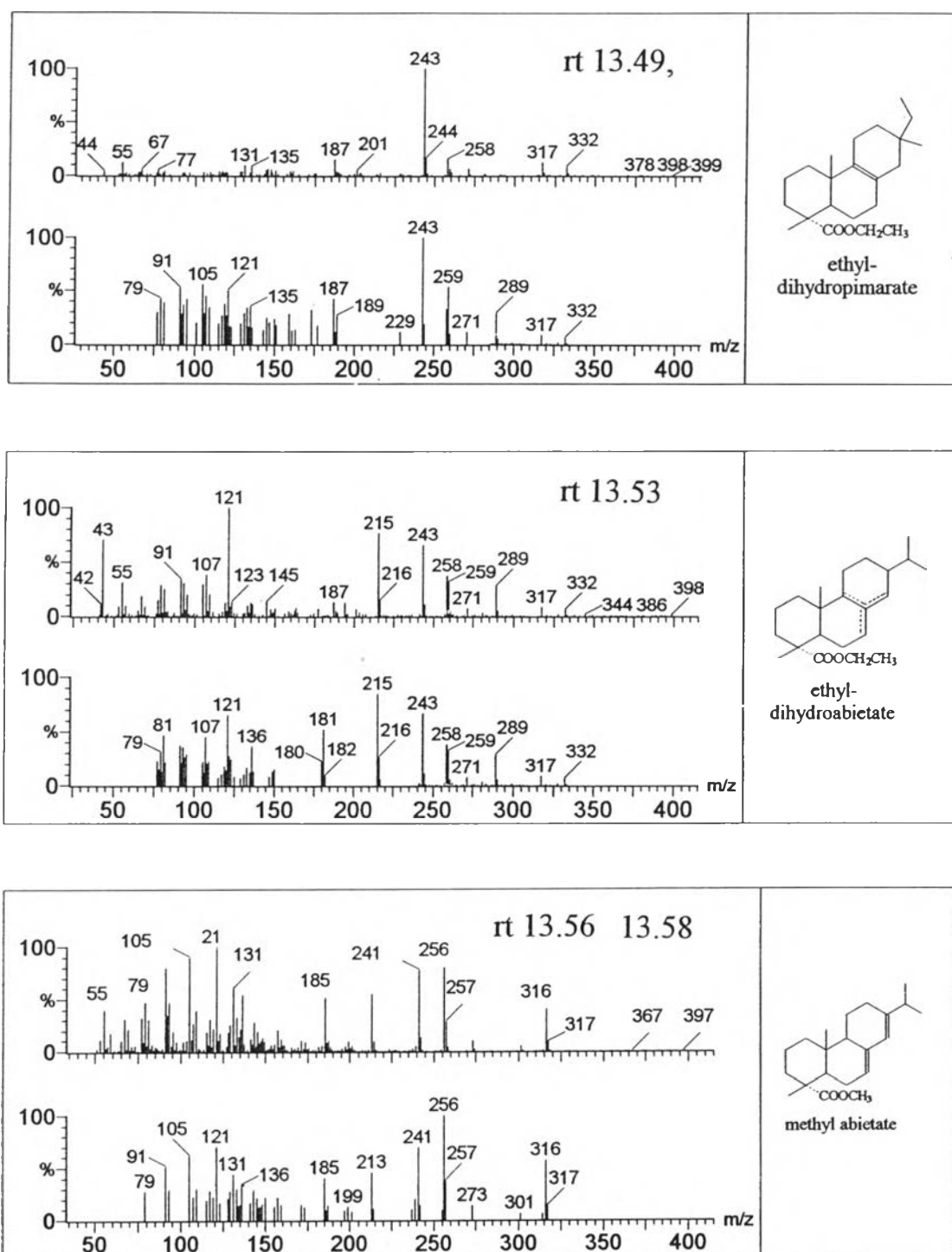


Figure A 14 Mass spectra of hydrogenated rosins produced with various catalyst types. (continued)

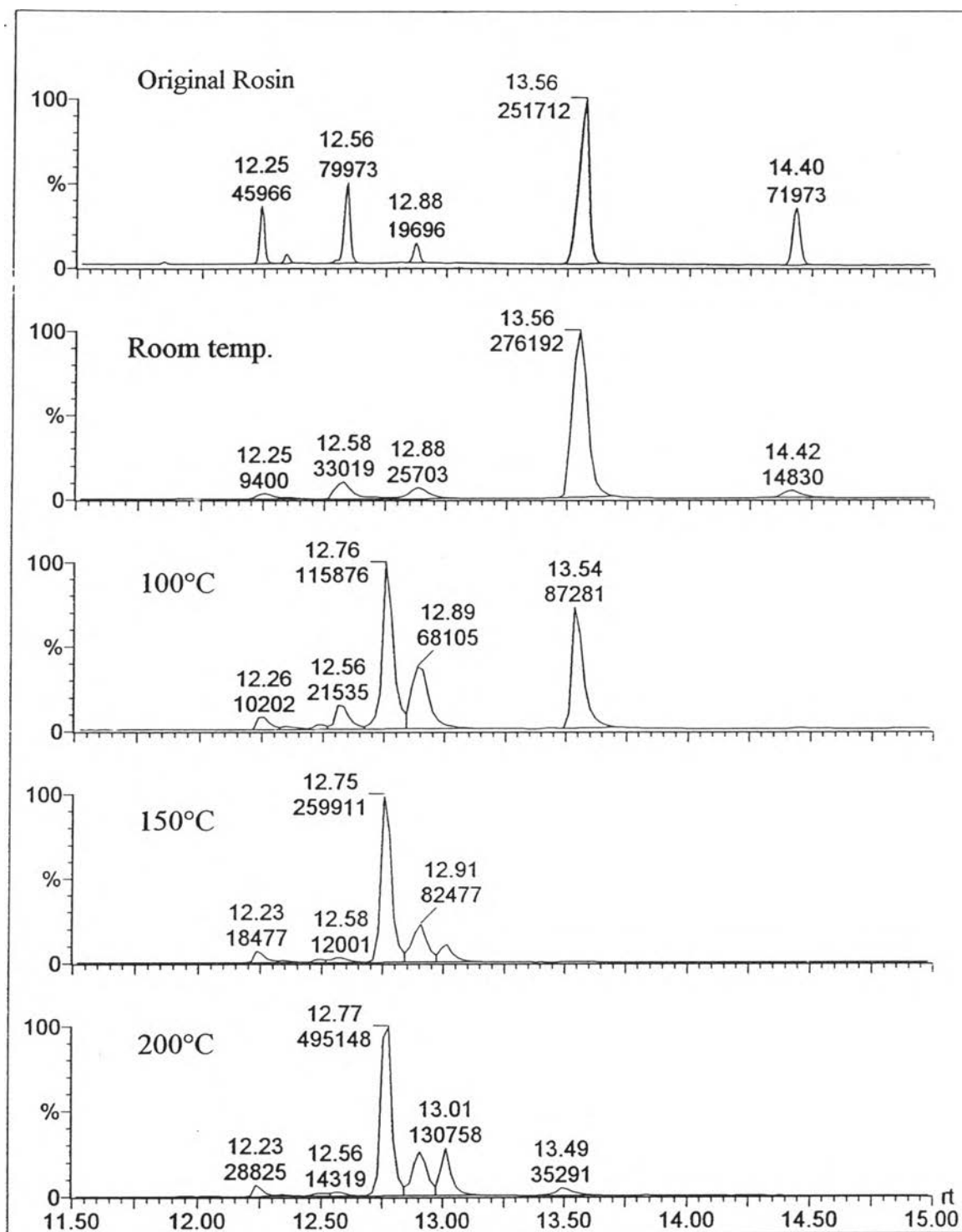


Figure A 15 GC-MS chromatograms of hydrogenated rosins produced at various reaction temperatures.



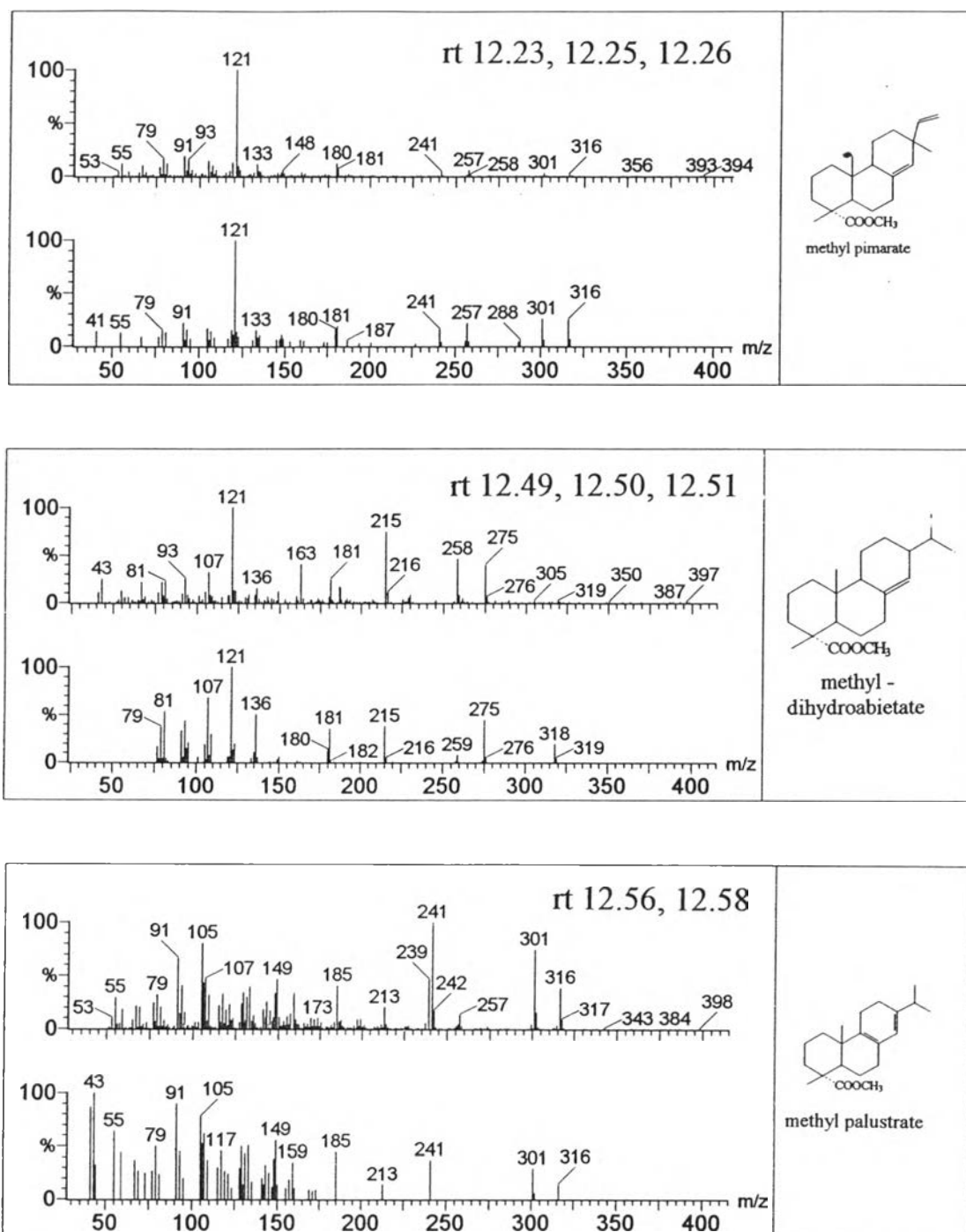


Figure A 16 Mass spectra of hydrogenated rosins produced at various reaction temperatures.

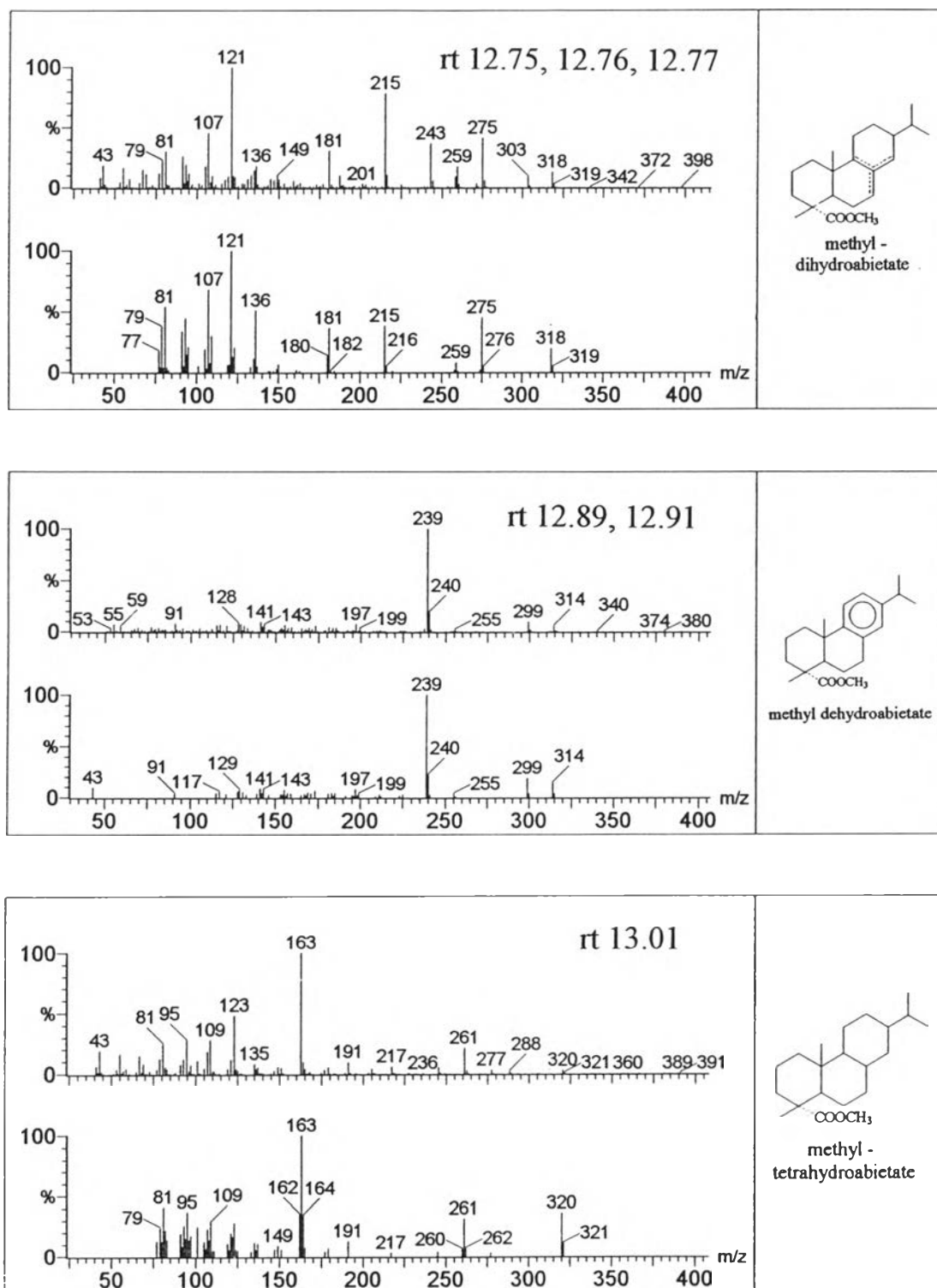


Figure A 16 Mass spectra of hydrogenated rosins produced at various reaction temperatures. (continued)

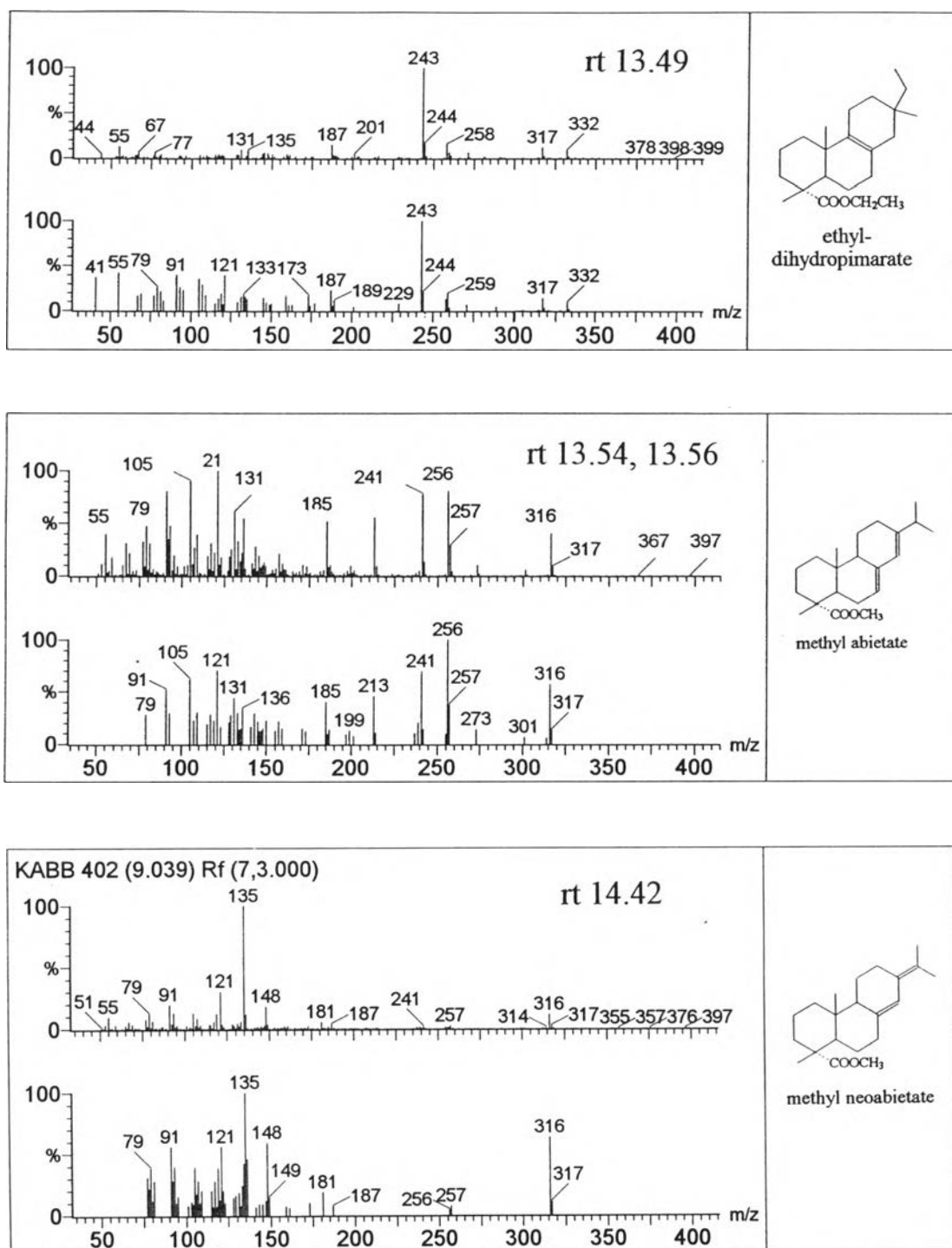


Figure A 16 Mass spectra of hydrogenated rosins produced at various reaction temperatures. (continued)



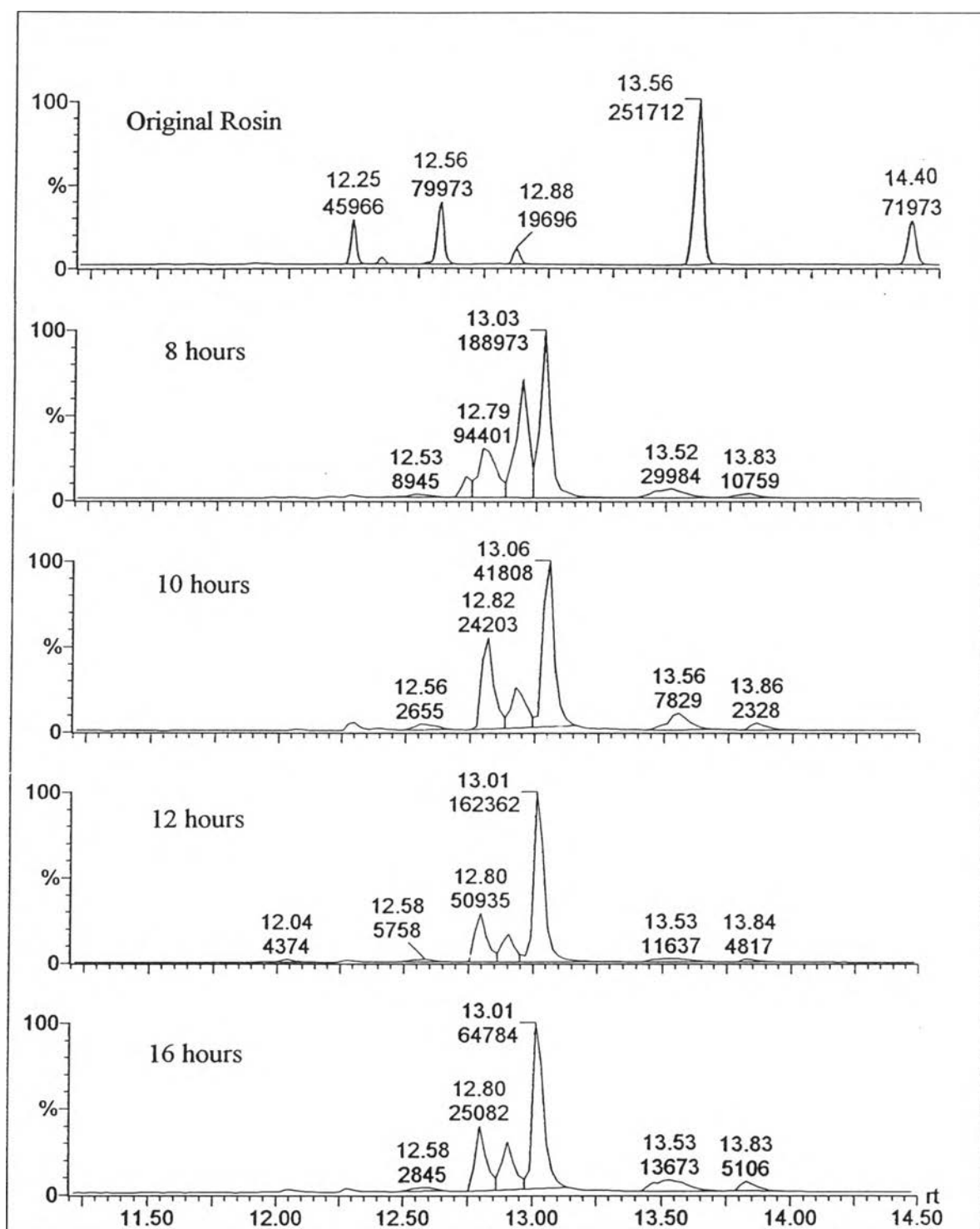


Figure A 17 GC-MS chromatograms of hydrogenated rosins produced during various reaction times.

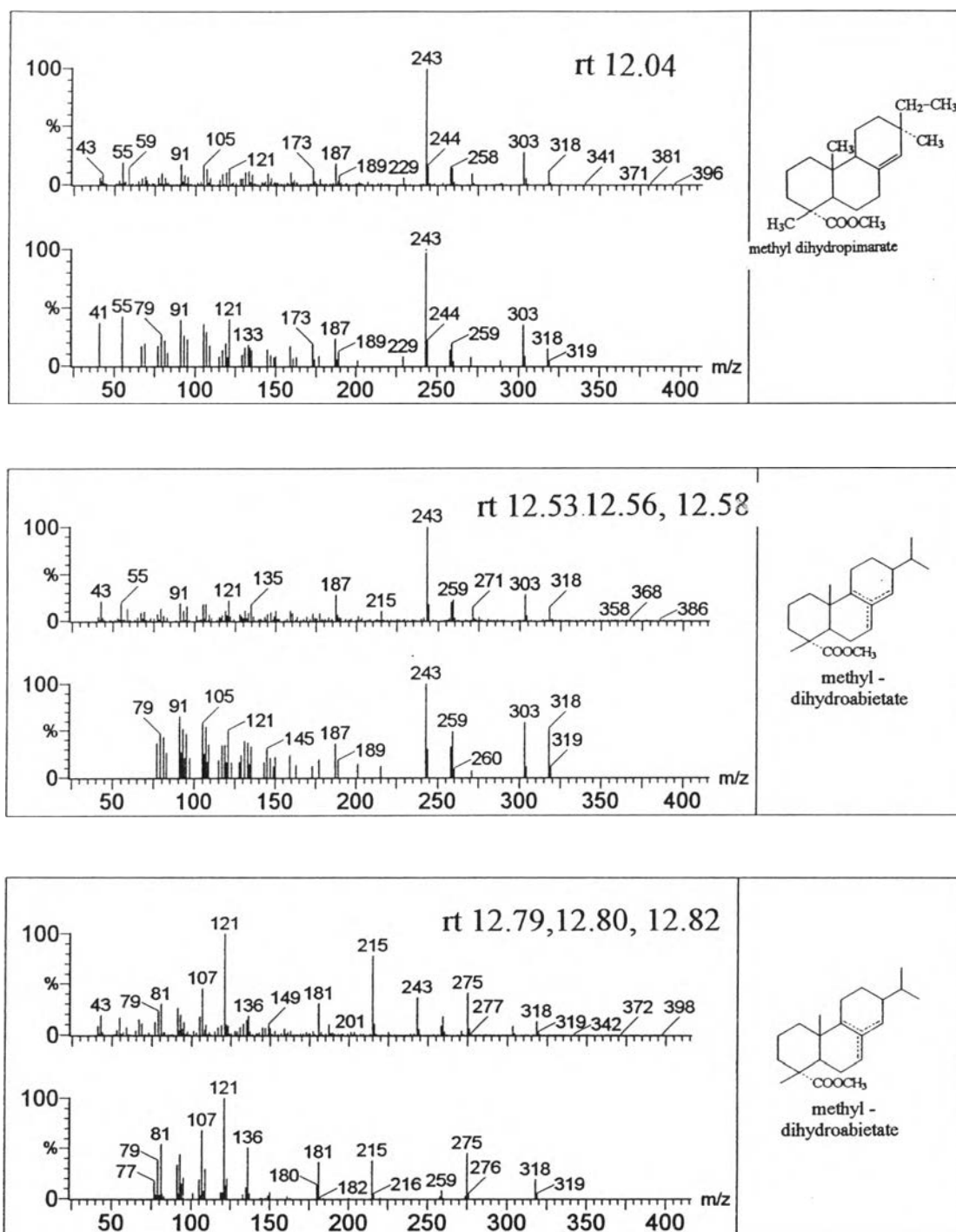


Figure A 18 Mass spectra of hydrogenated rosins produced during various reaction times.

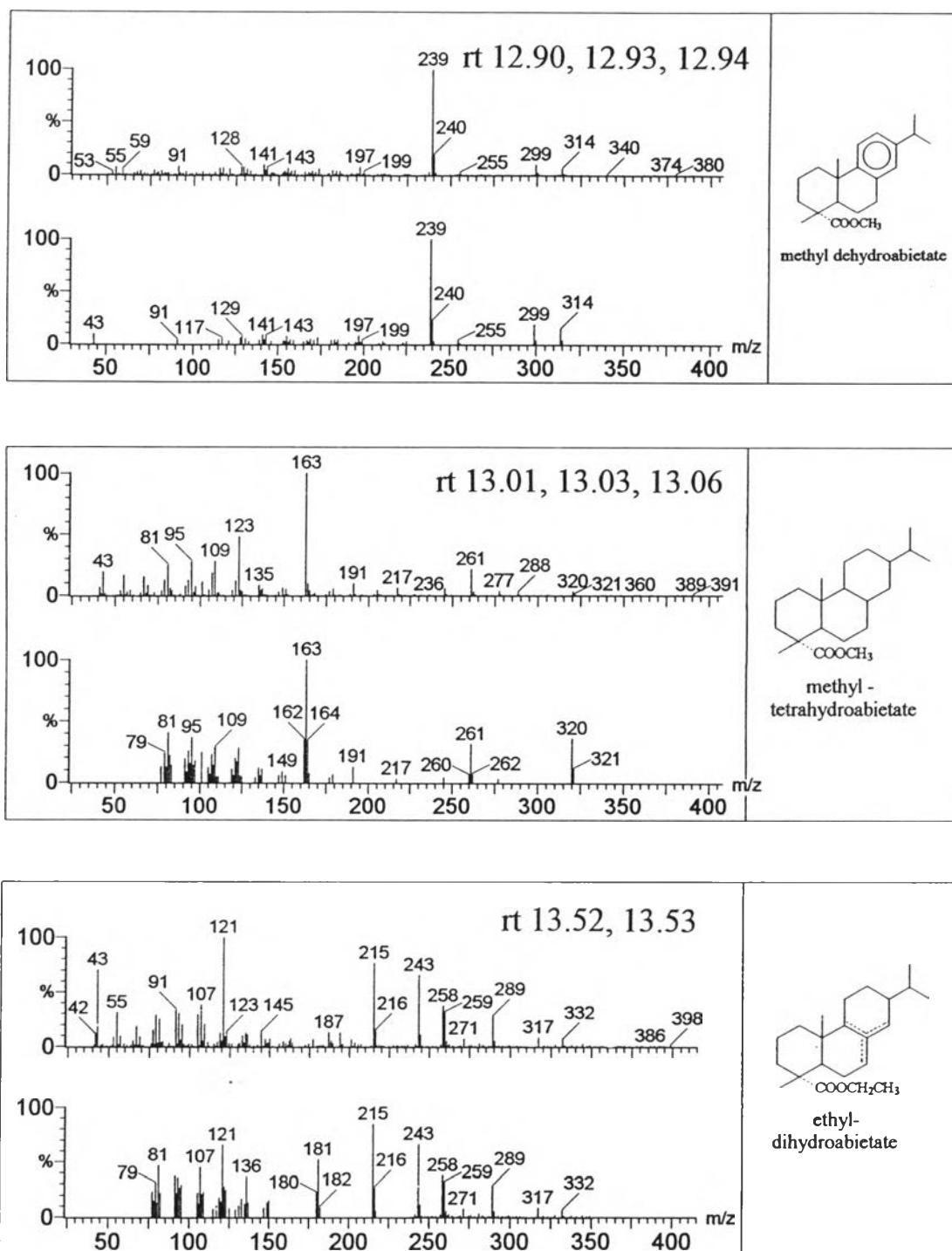


Figure A 18 Mass spectra of hydrogenated rosins produced during various reaction times. (continued)

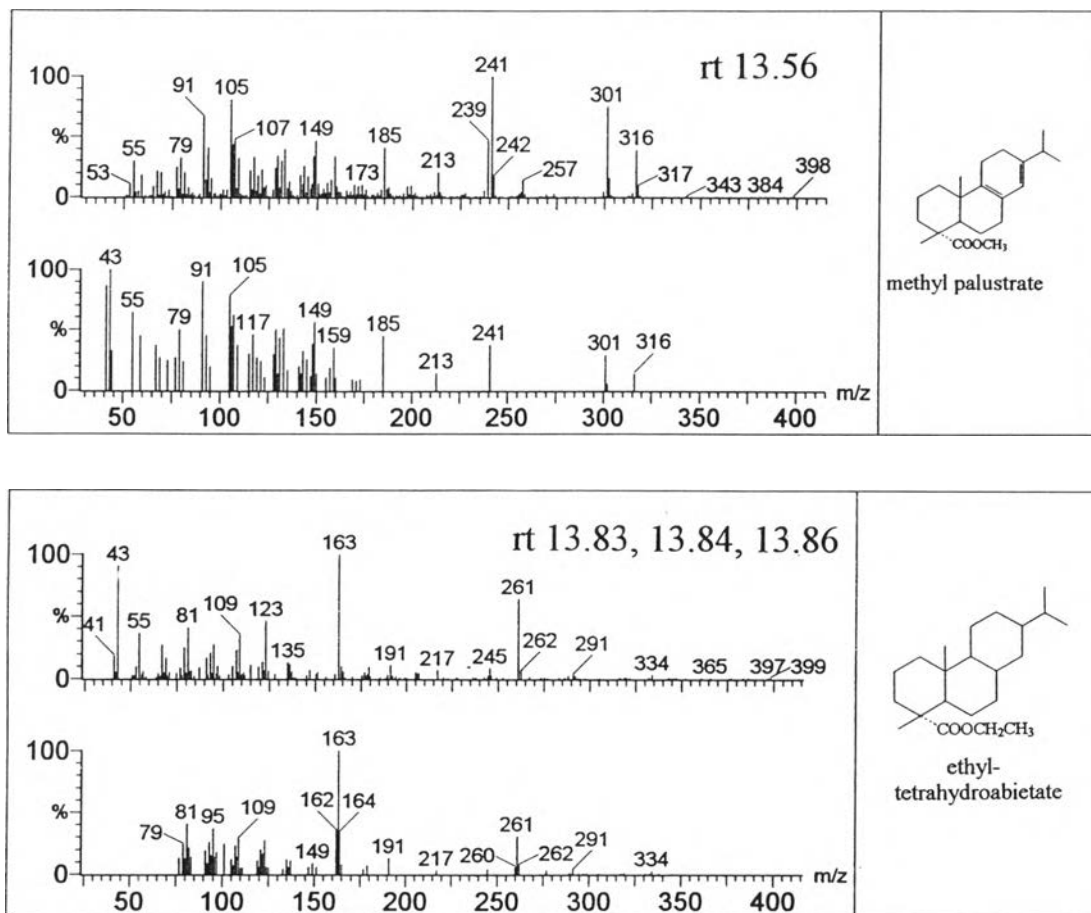


Figure A 18 Mass spectra of hydrogenated rosins produced during various reaction times. (continued)

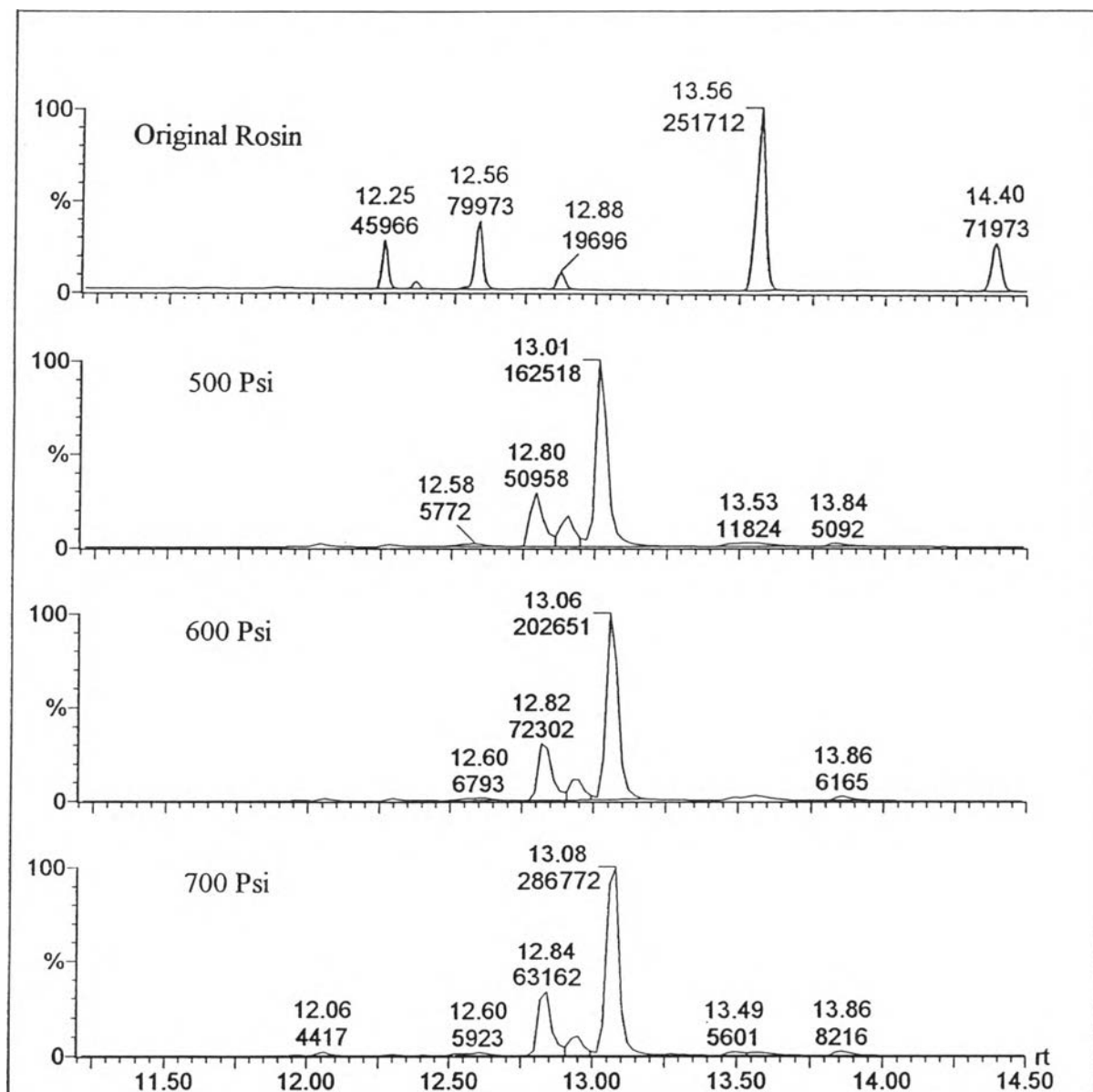


Figure A 19 GC-MS chromatograms of hydrogenated rosins produced at various hydrogen pressures.

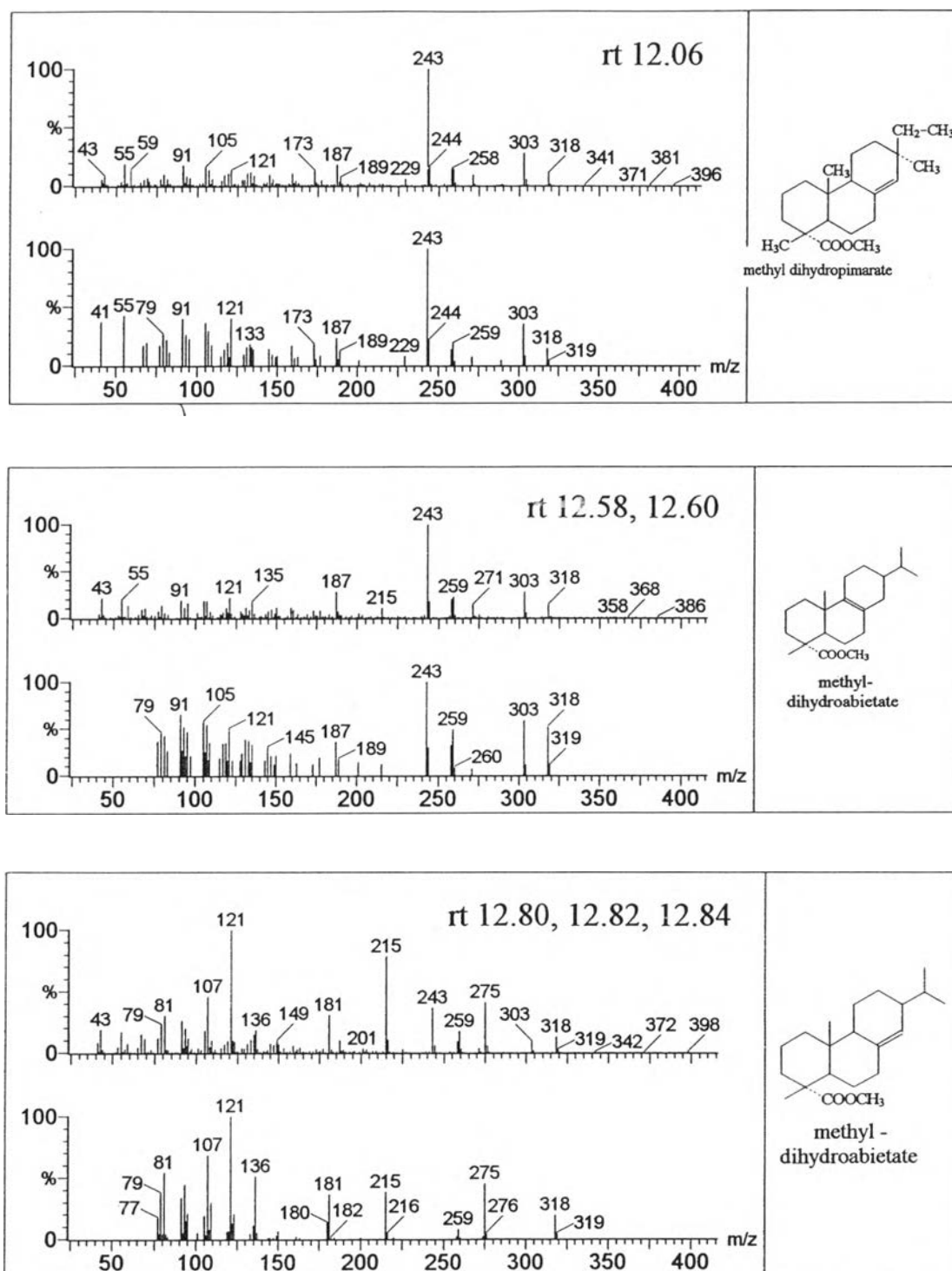


Figure A 20 Mass spectra of hydrogenated rosins produced at various hydrogen pressures.

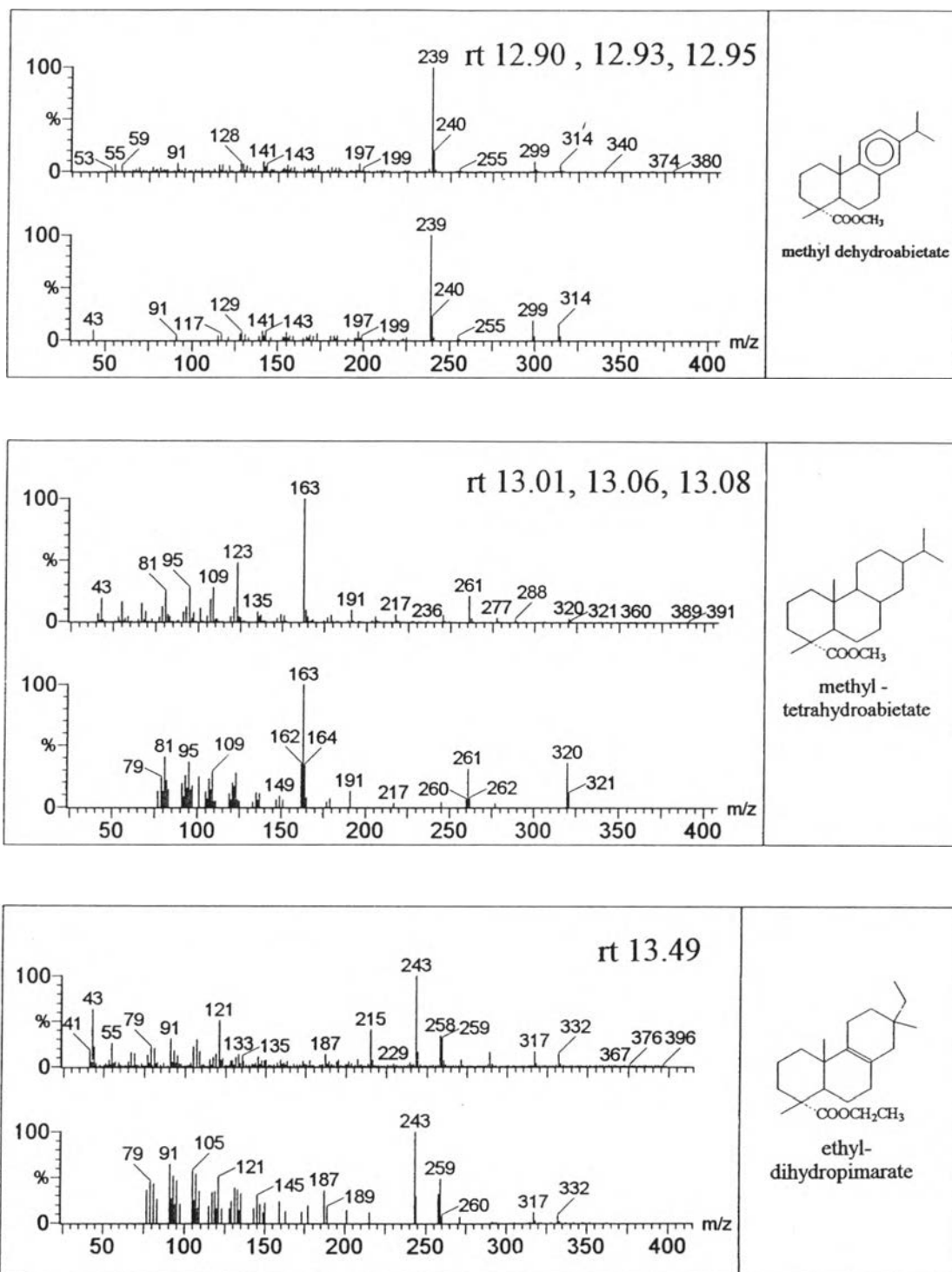


Figure A 20 Mass spectra of hydrogenated rosins produced at various hydrogen pressures. (continued)

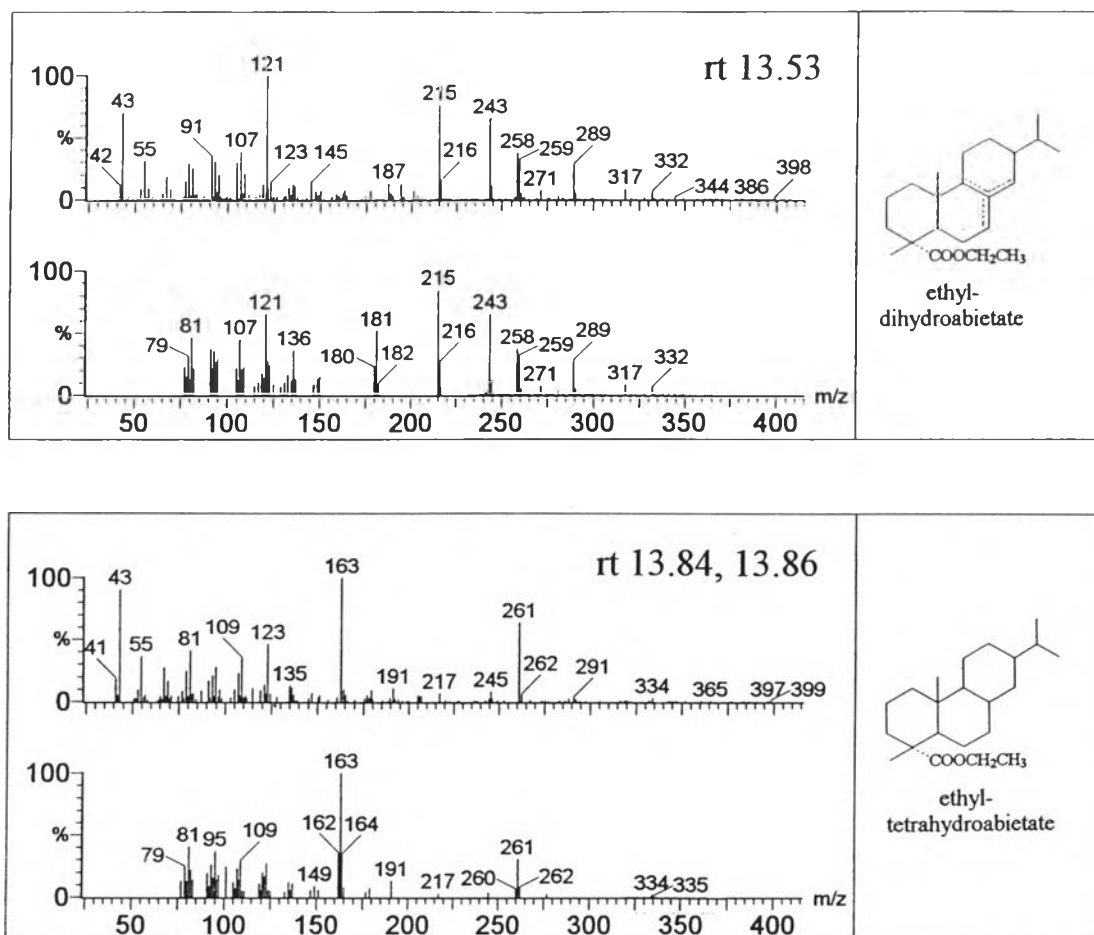


Figure A 20 Mass spectra of hydrogenated rosins produced at various hydrogen pressures. (continued)

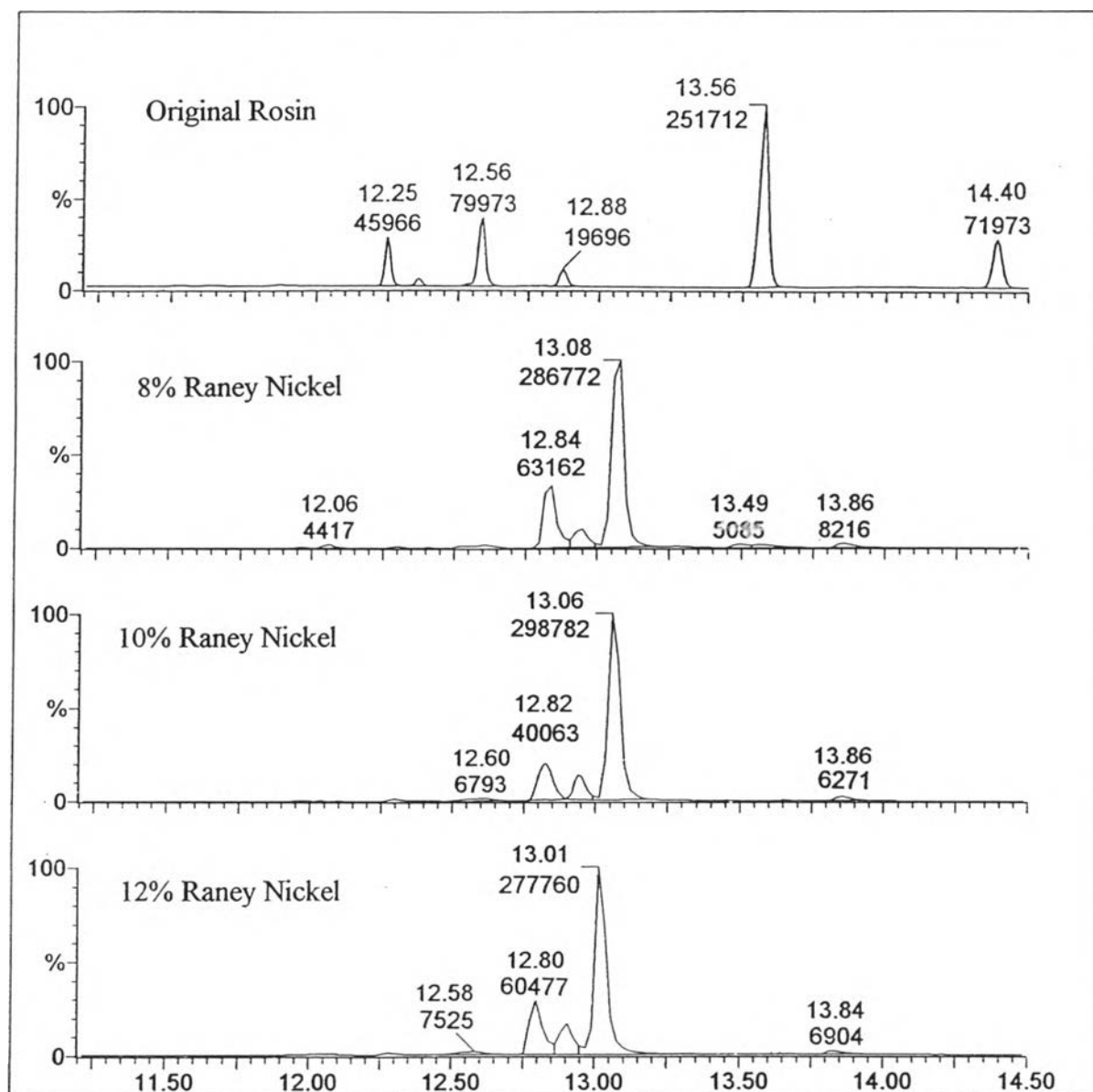


Figure A 21 GC-MS chromatograms of hydrogenated rosins produced at various catalyst concentration (by wt of rosin).



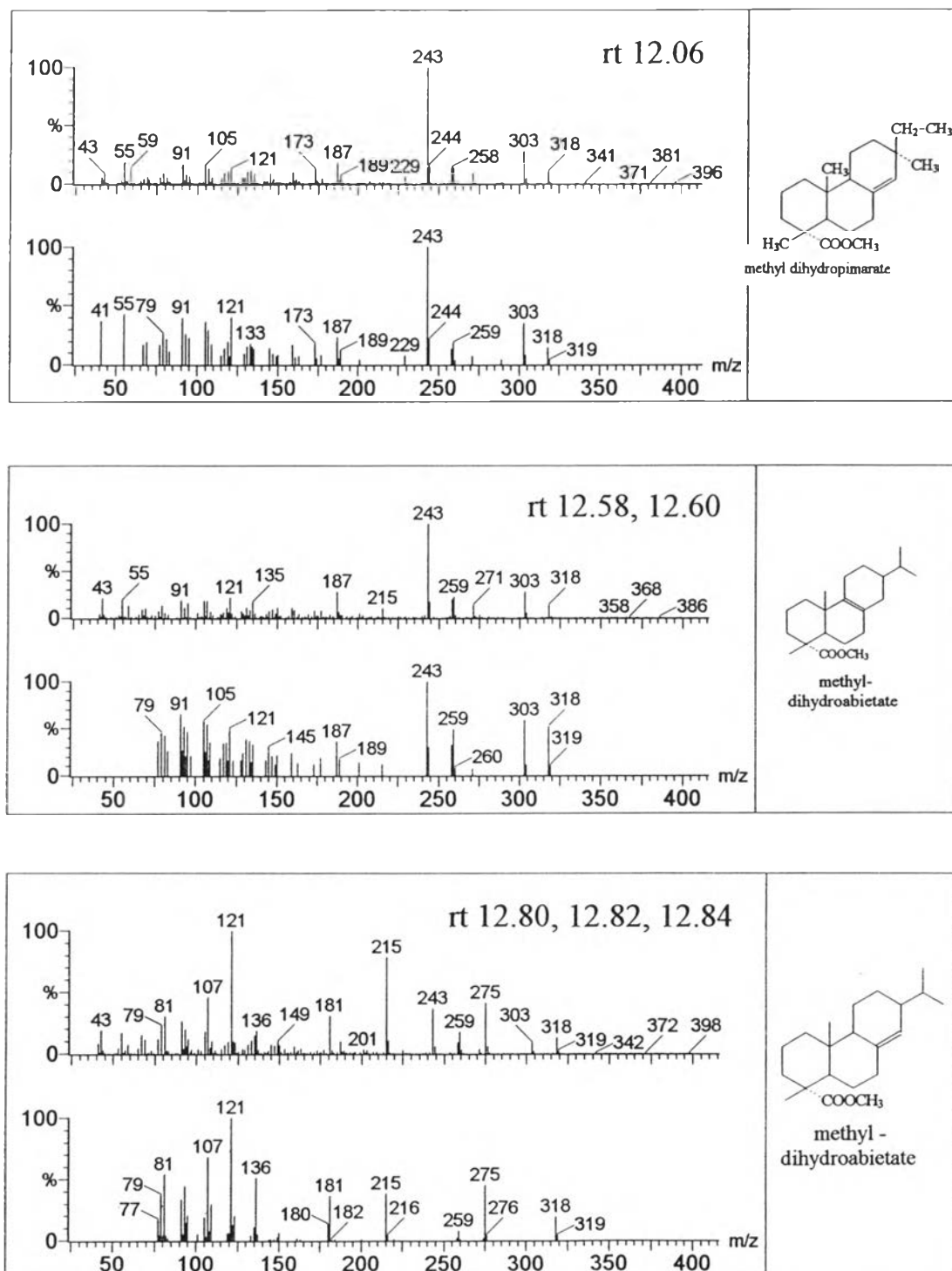


Figure A 22 Mass spectra of hydrogenated rosins produced at various catalyst concentrations.

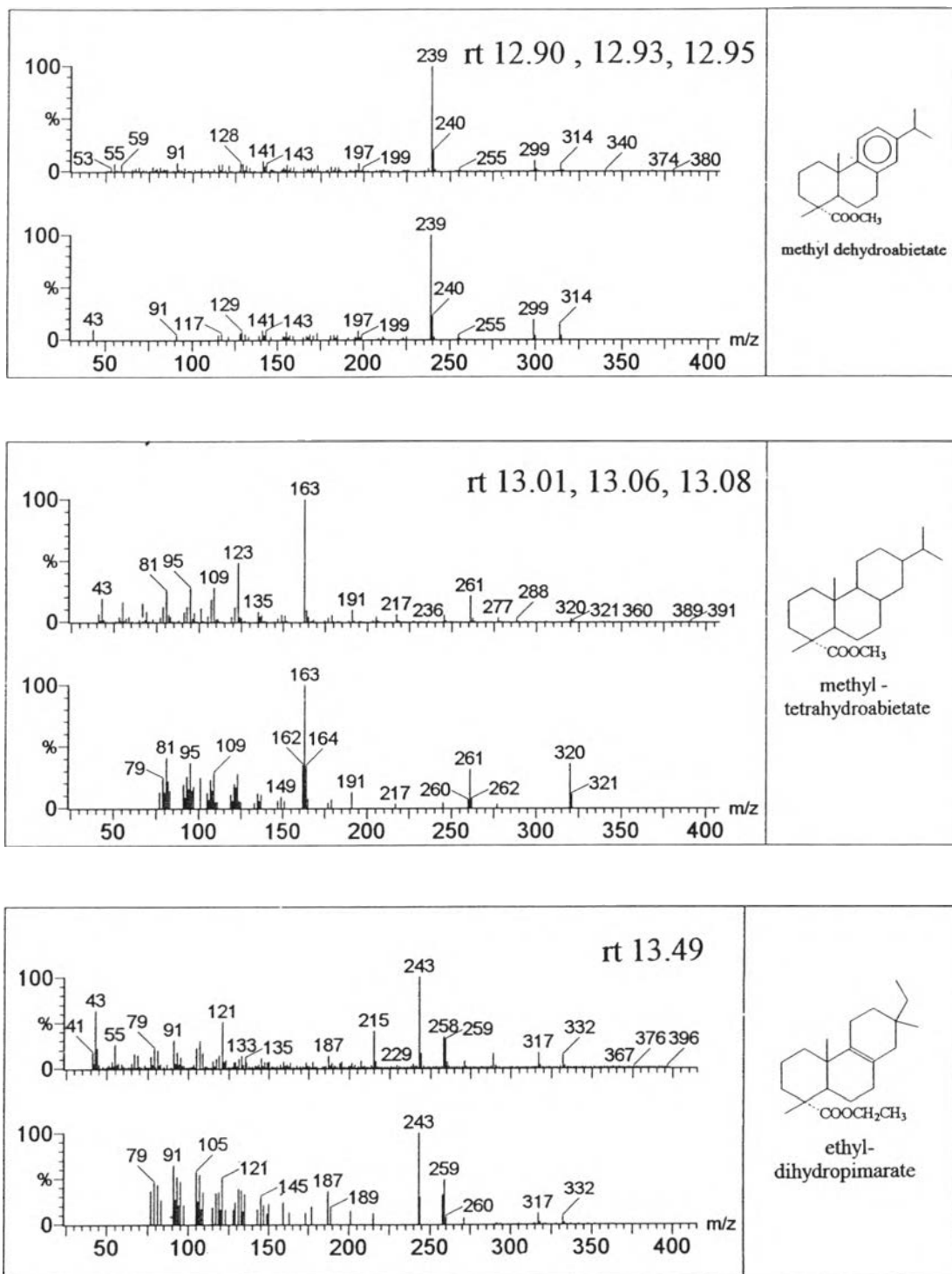


Figure A 22 Mass spectra of hydrogenated rosins produced at various catalyst concentrations. (continued)

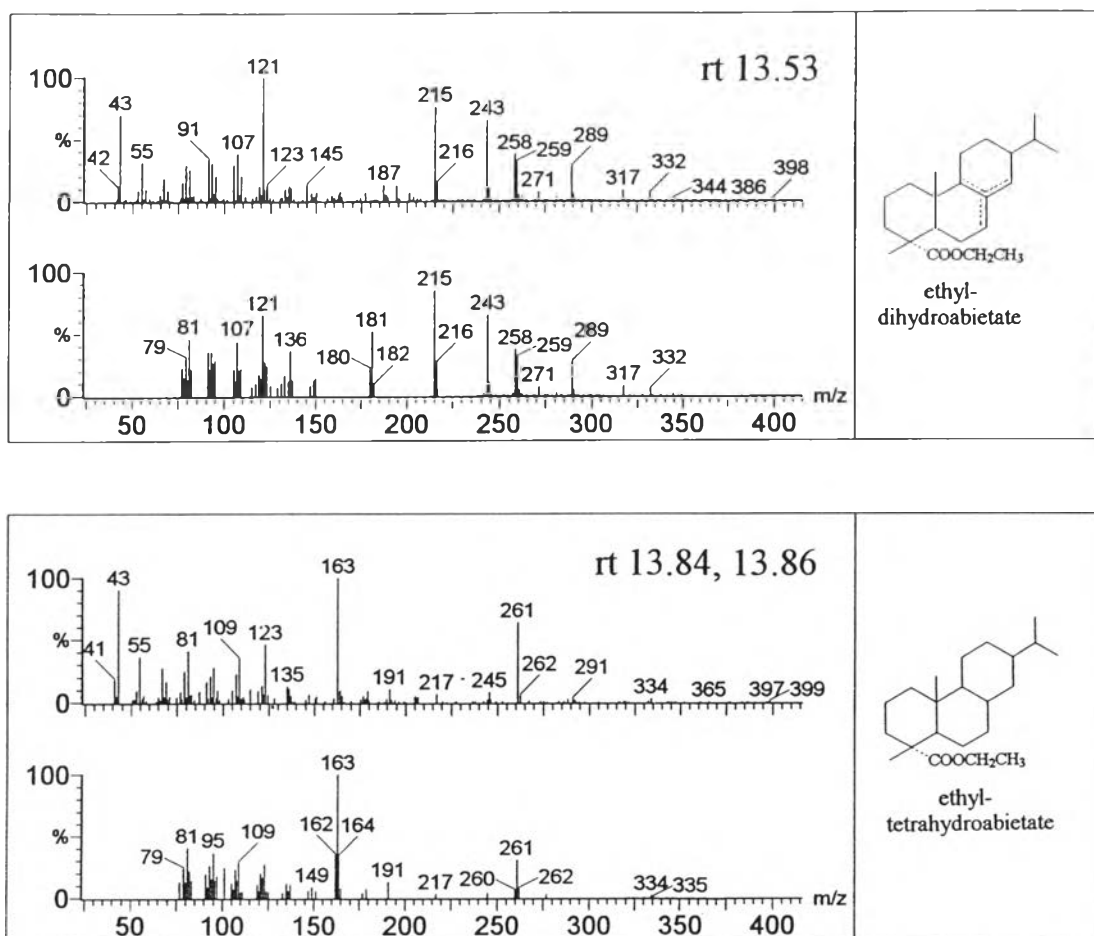


Figure A 22 Mass spectra of hydrogenated rosins produced at various catalyst concentrations. (continued)

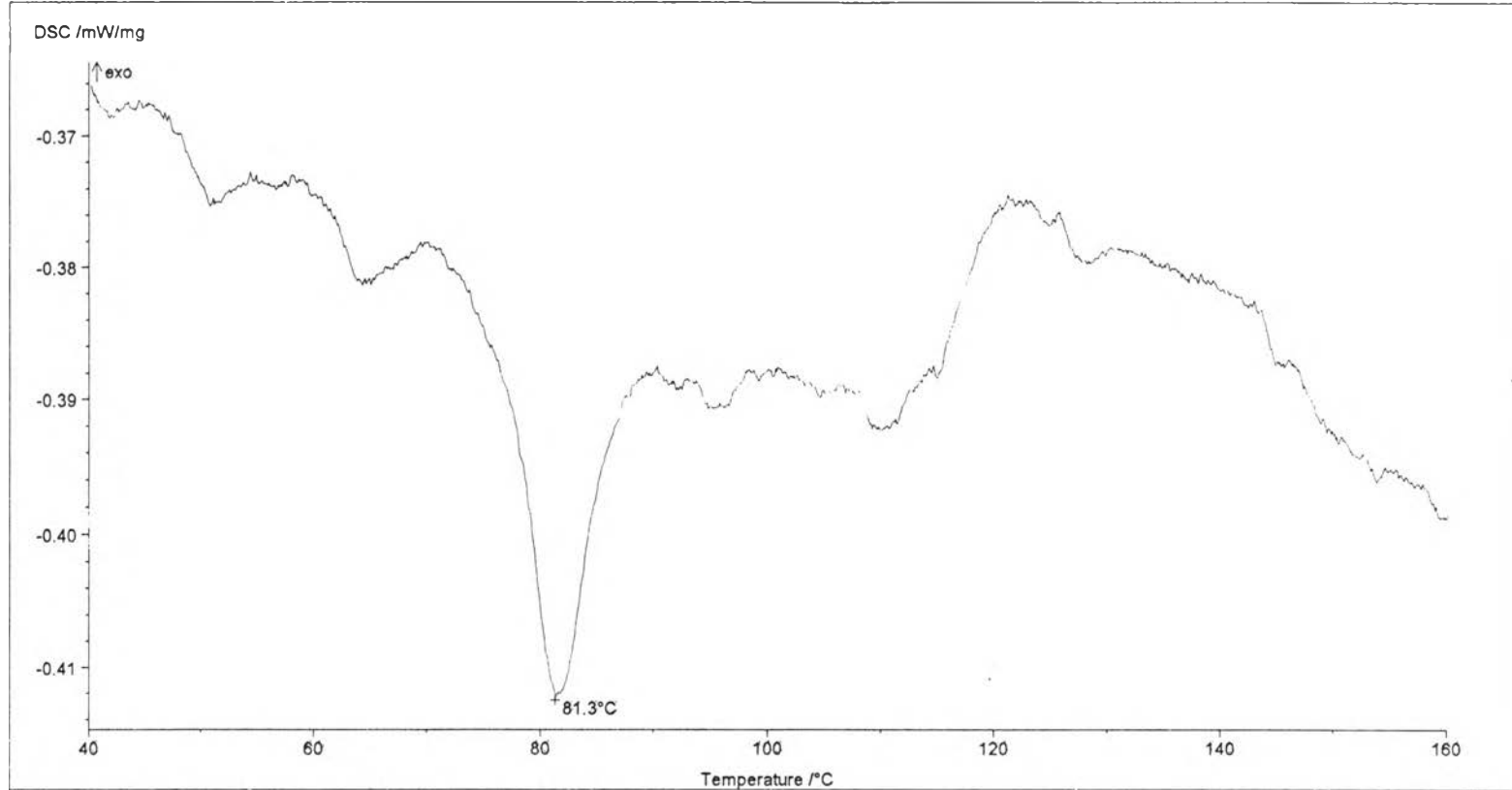


Figure A 23 DSC of hydrogenated rosin produced at optimum condition.

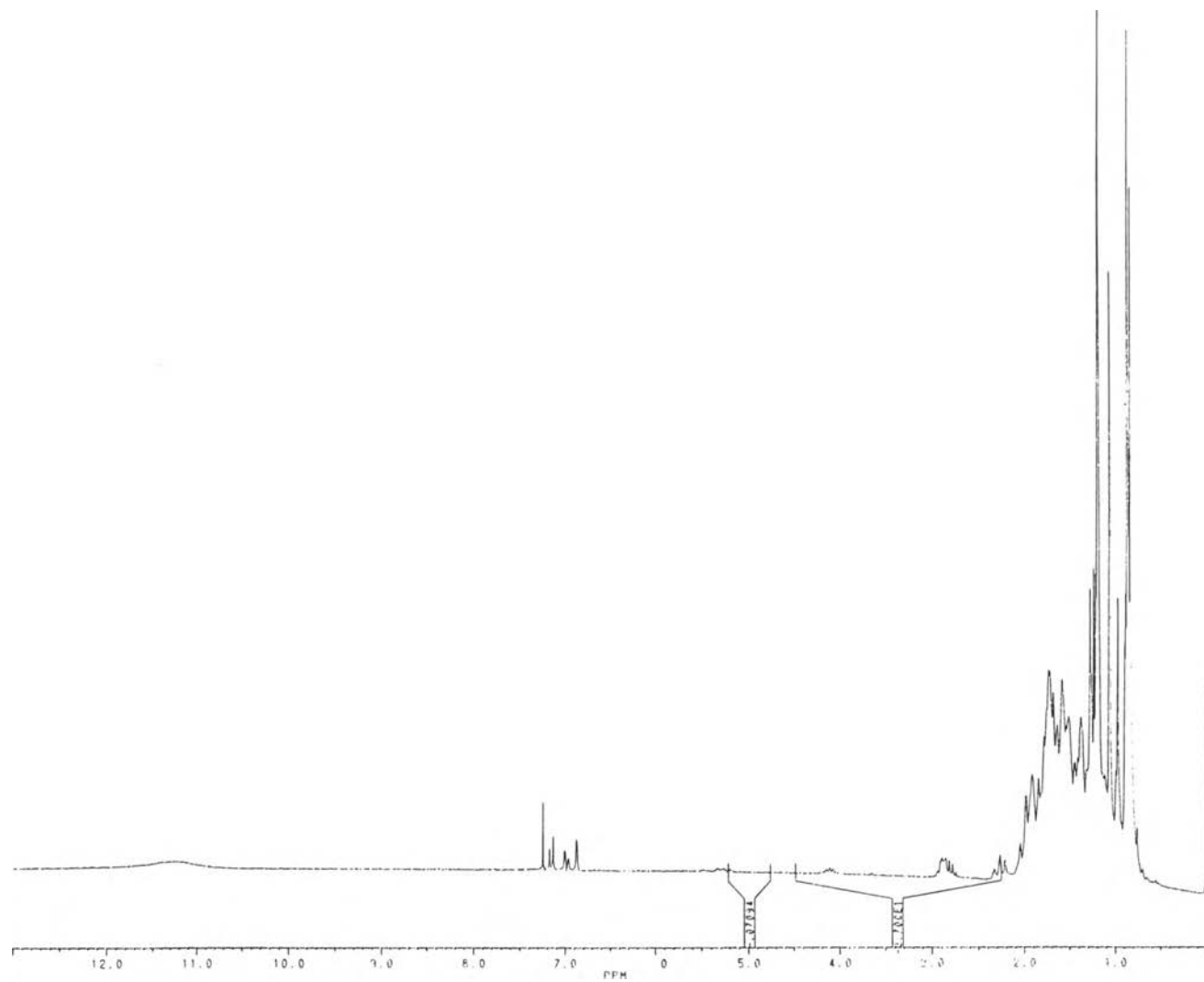


Figure A 24 $^1\text{H-NMR}$ of hydrogenated rosin produced at optimum condition.

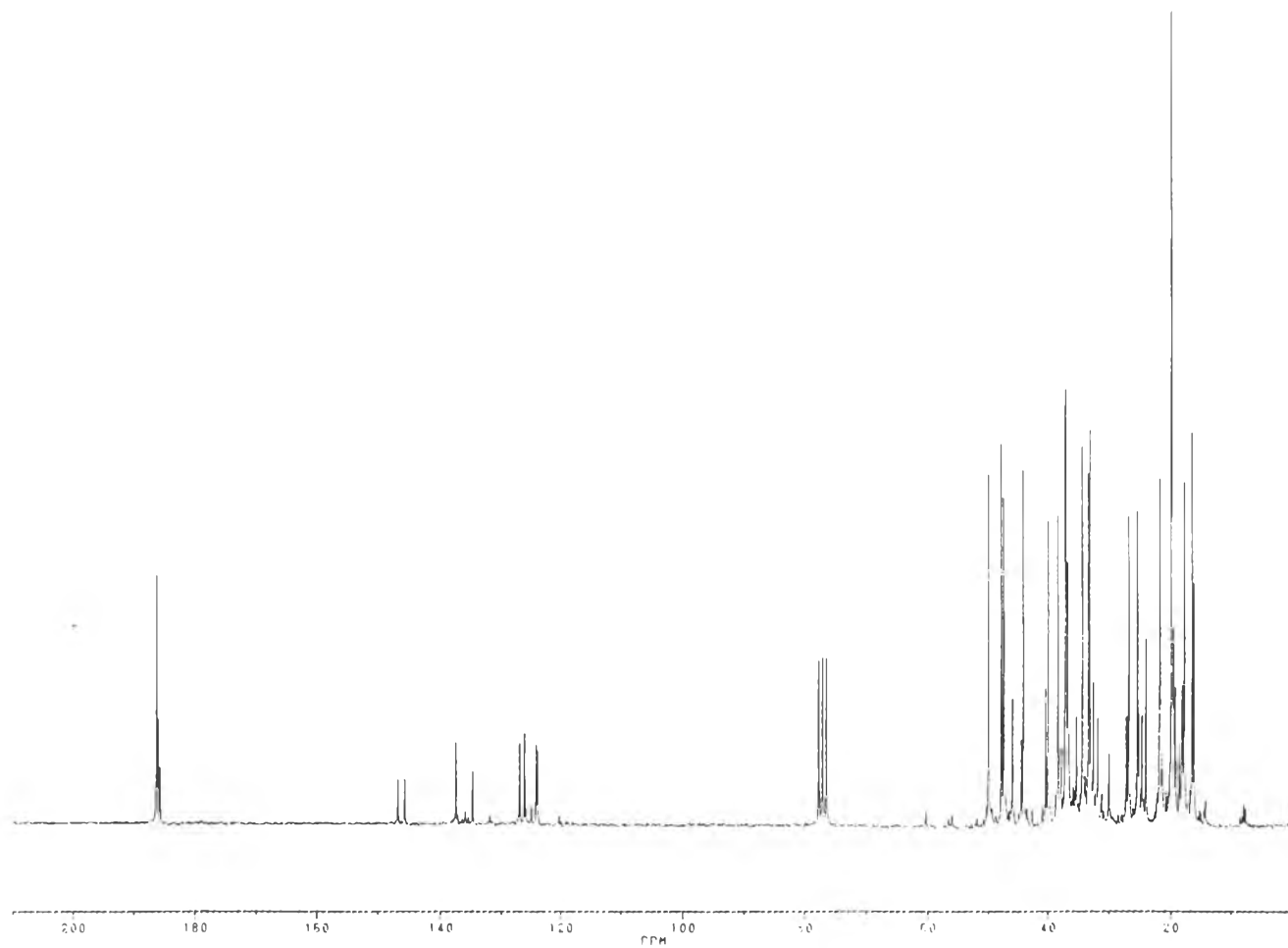


Figure A 25 ^{13}C -NMR of hydrogenated rosin produced at optimum condition.

VITA

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