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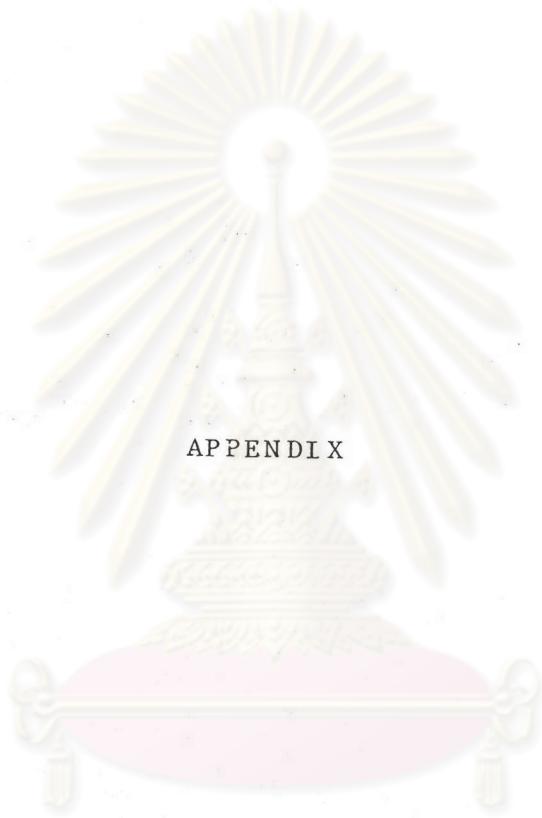
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ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย



APPENDIX

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

Silica gel G/chloroform : methanol (8:2)

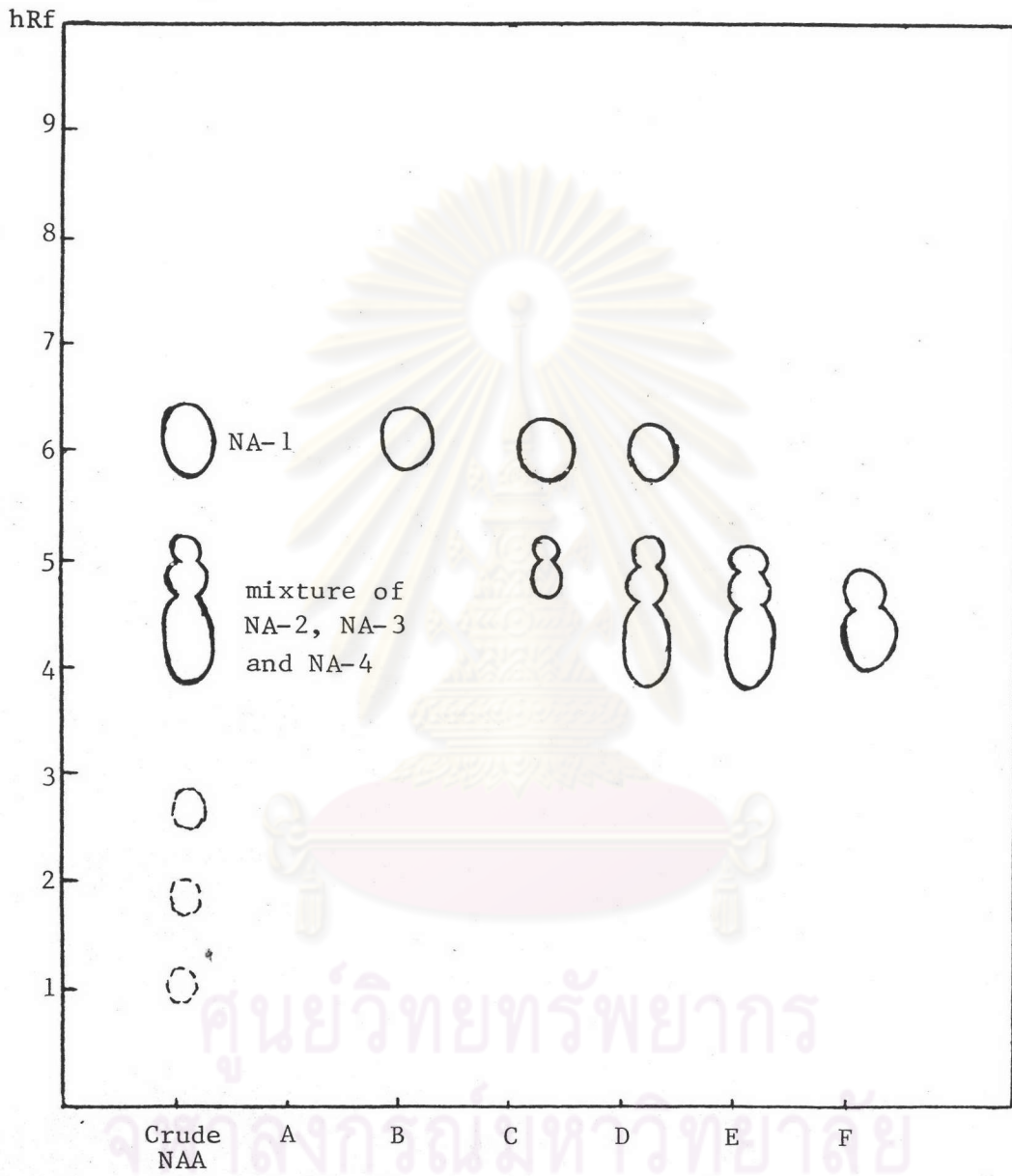


Figure 9 Thin layer chromatogram of crude alkaloid (NAA)

Silica gel G/benzene + ethyl acetate + methanol (8 + 4 + 2)

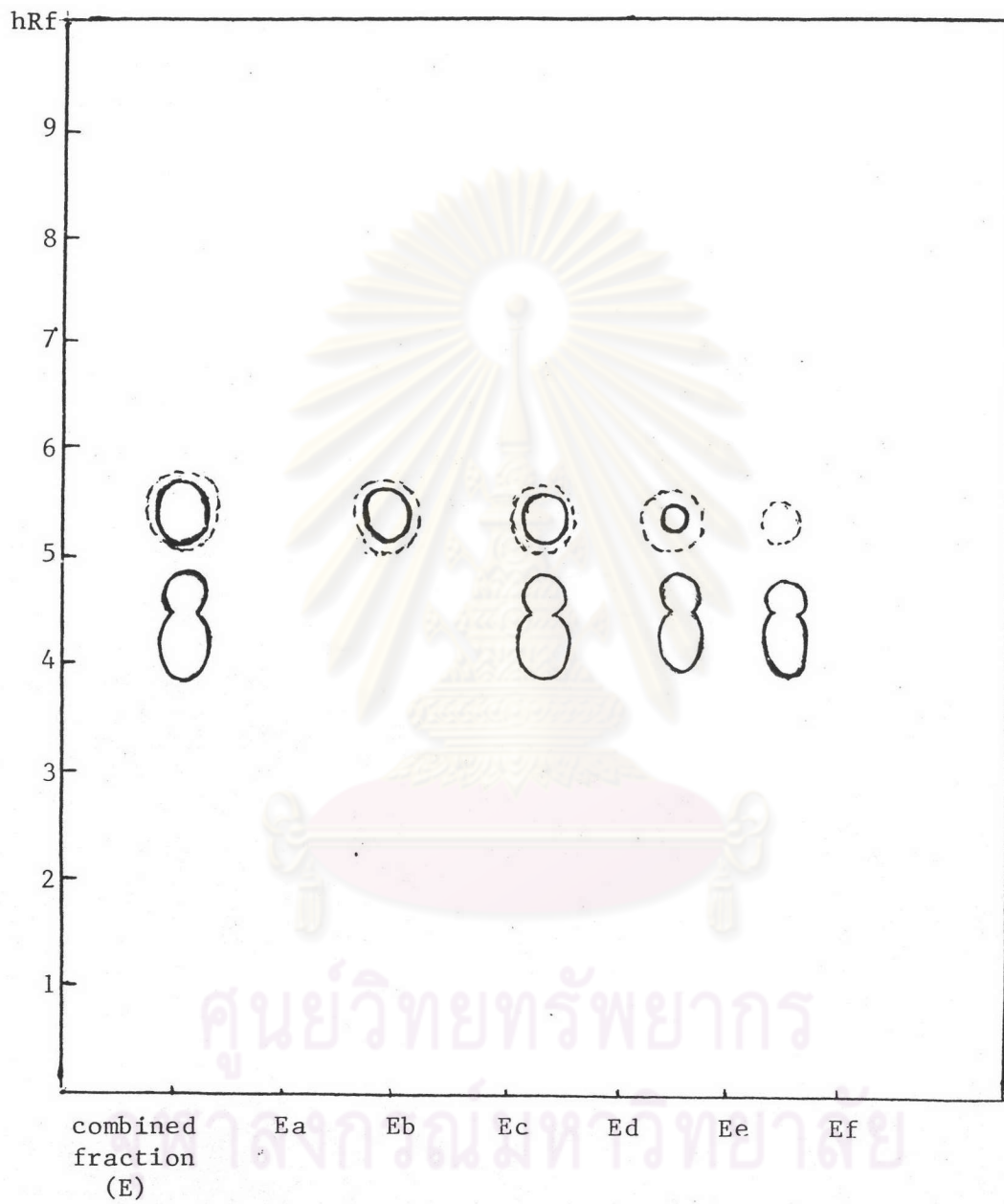


Figure 10 Thin layer chromatogram of alkaloids from combined fraction E

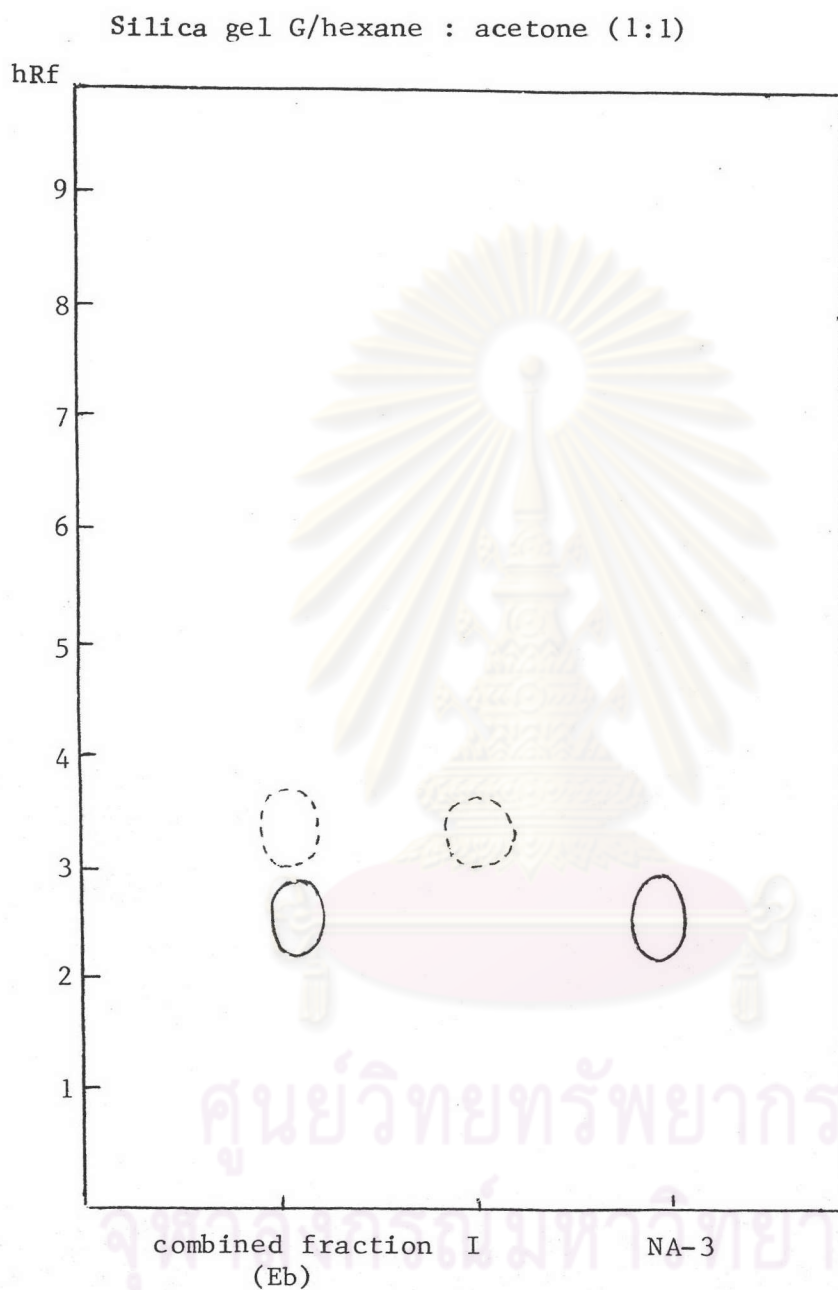


Figure 11 Thin layer chromatogram of crude alkaloid from combined fraction Eb (isolated NA-3) (I = impurity fluorescens blue when it is exposed to UV light)

Silica gel G/ethyl acetate : methanol (1:1)

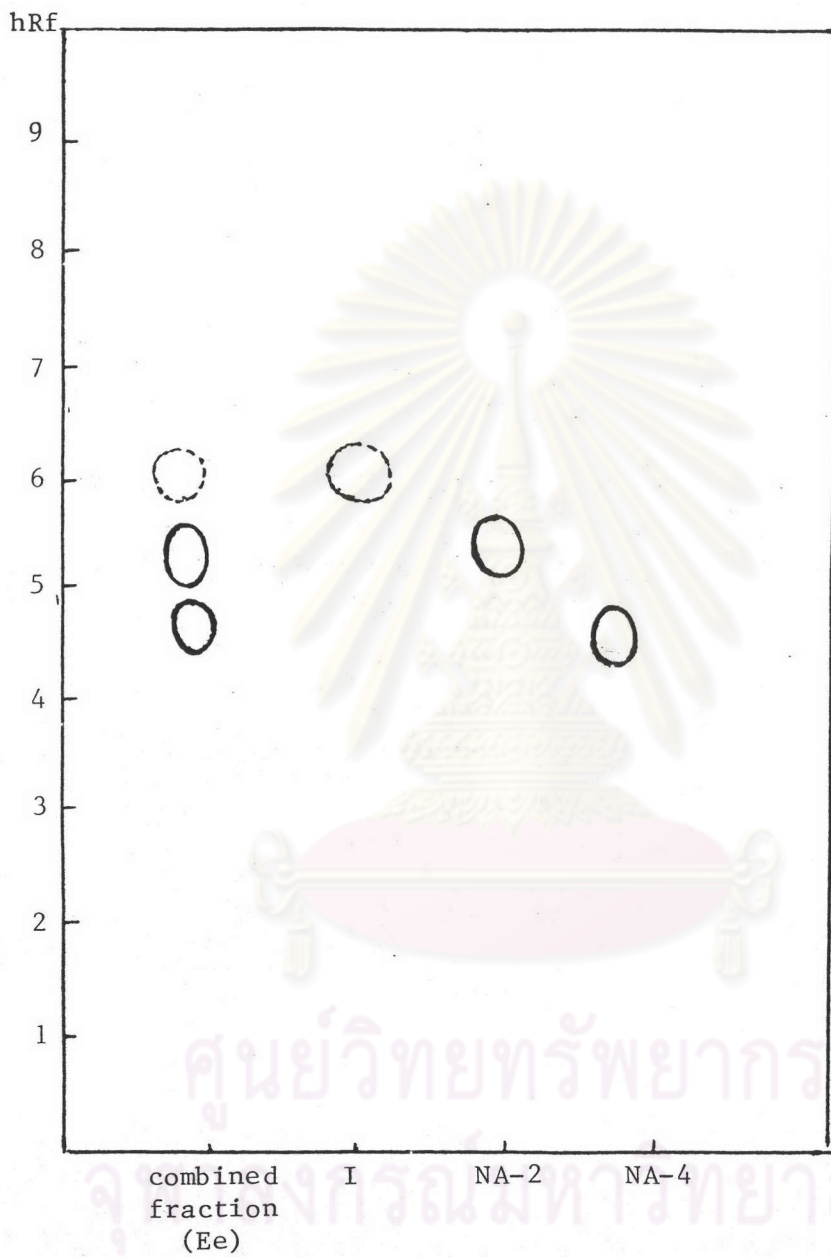


Figure 12 Thin layer chromatogram of alkaloids
from combined fraction Ee (isolated NA-2
and NA-4)

(I = impurity fluoresces blue when it is
exposed to UV light)

Silica gel G/chloroform : methanol (9:1)

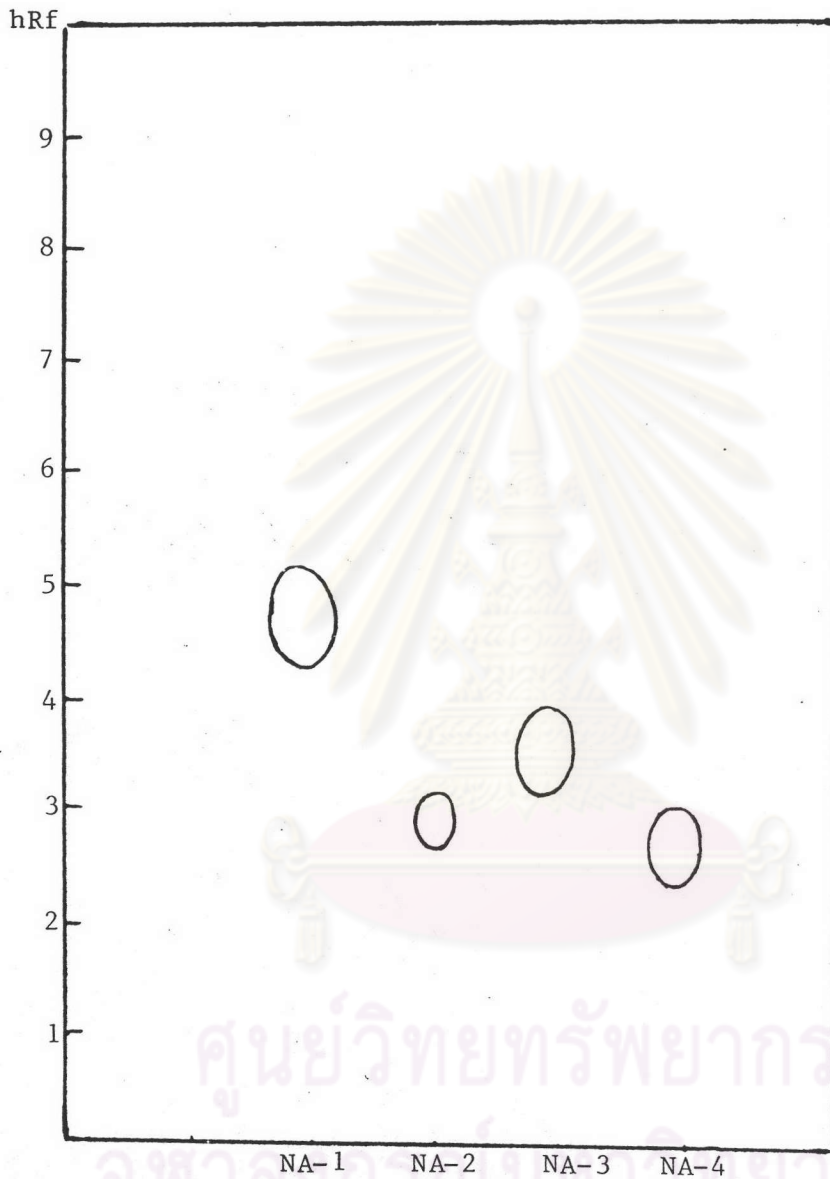


Figure 13 Thin layer chromatogram of alkaloids
 NA-1 (isolated isoboldine), NA-2 (isolated
 bisnorargemonine), NA-3 (isolated norcinnamo-
 laurine) and NA-4 (isolated reticuline)

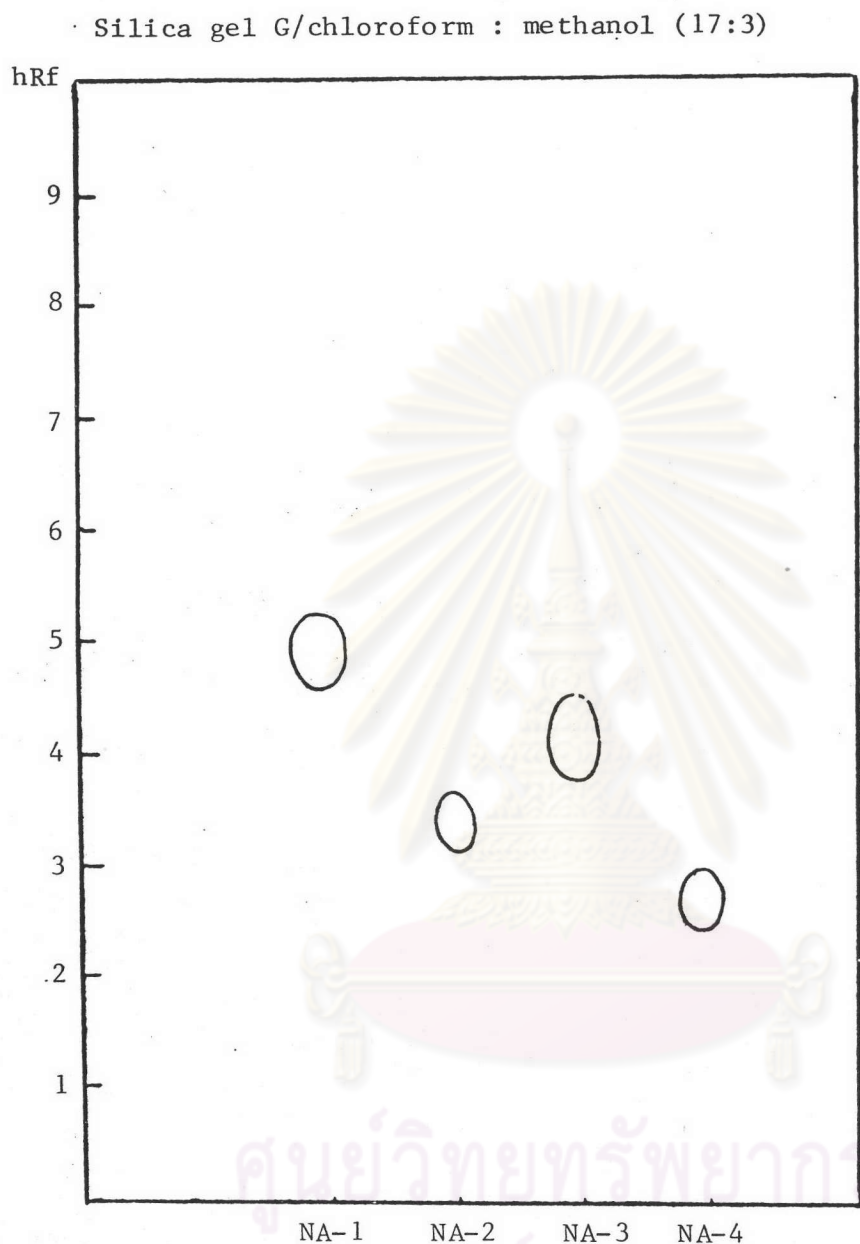


Figure 14 Thin layer chromatogram of alkaloids NA-1 (isolated isoboldine), NA-2 (isolated bisnorargemonine), NA-3 (isolated norcinnamolaurine) and NA-4 (isolated reticuline)

Silica gel G/benzene + ethyl acetate + methanol (8 + 4 + 2)

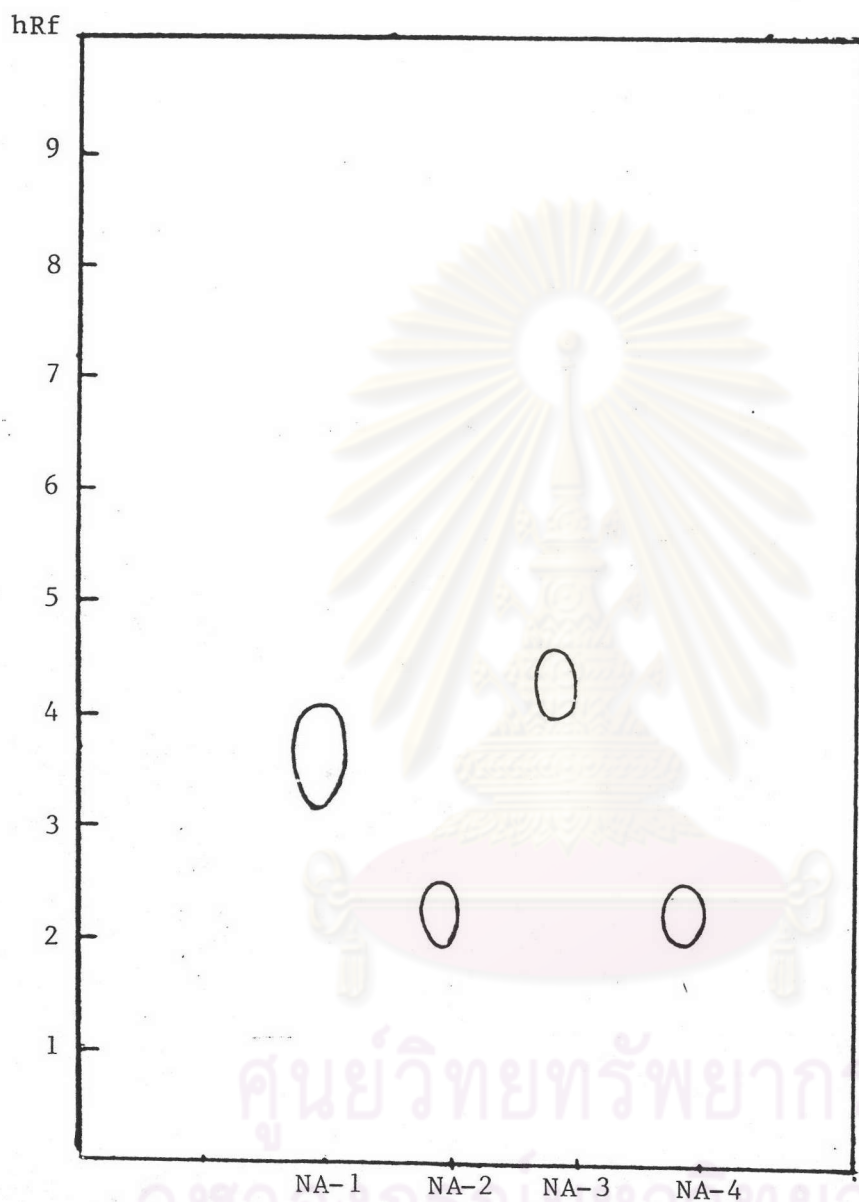


Figure 15 Thin layer chromatogram of alkaloids NA-1 (isolated isoboldine), NA-2 (isolated bisnorargemonine), NA-3 (isolated norcinnamolaurine) and NA-4 (isolated reticuline)

Silica gel G/ethyl acetate : methanol (1:1)

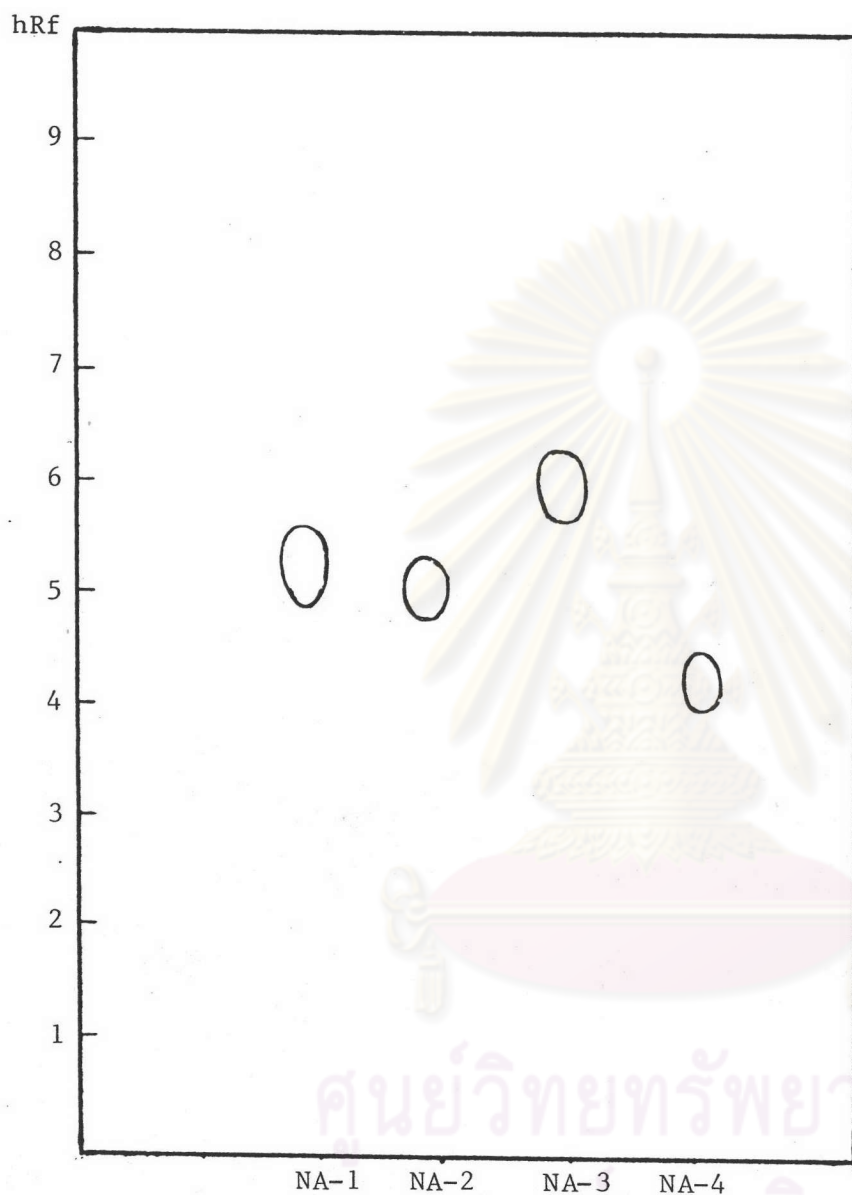


Figure 16 Thin layer chromatogram of alkaloids NA-1 (isolated isoboldine), NA-2 (isolated bisnorargemonine), NA-3 (isolated norcinnamolaurine) and NA-4 (isolated reticuline)

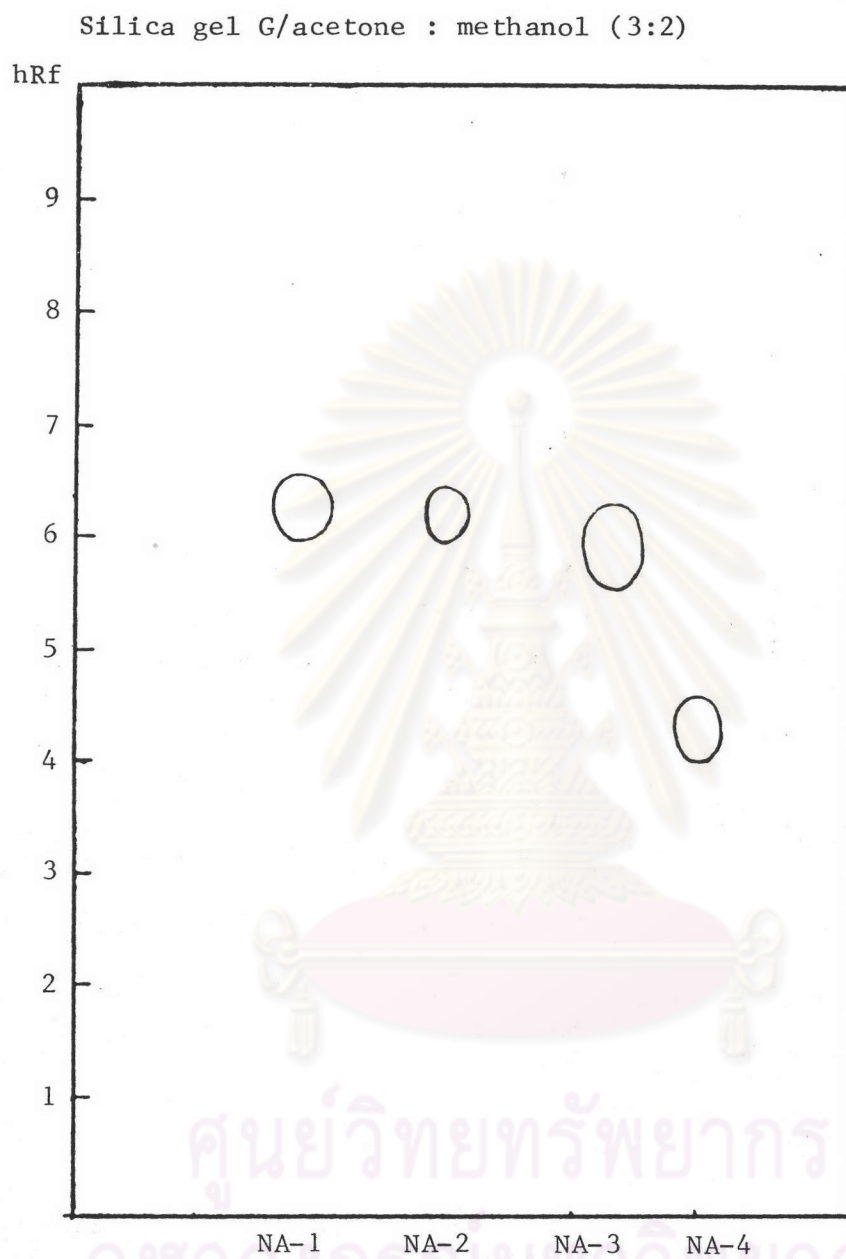


Figure 17 Thin layer chromatogram of alkaloids NA-1 (isolated isoboldine), NA-2 (isolated bisnorargemonine), NA-3 (isolated norcinnamolaurine) and NA-4 (isolated reticuline)

Silica gel G/methanol

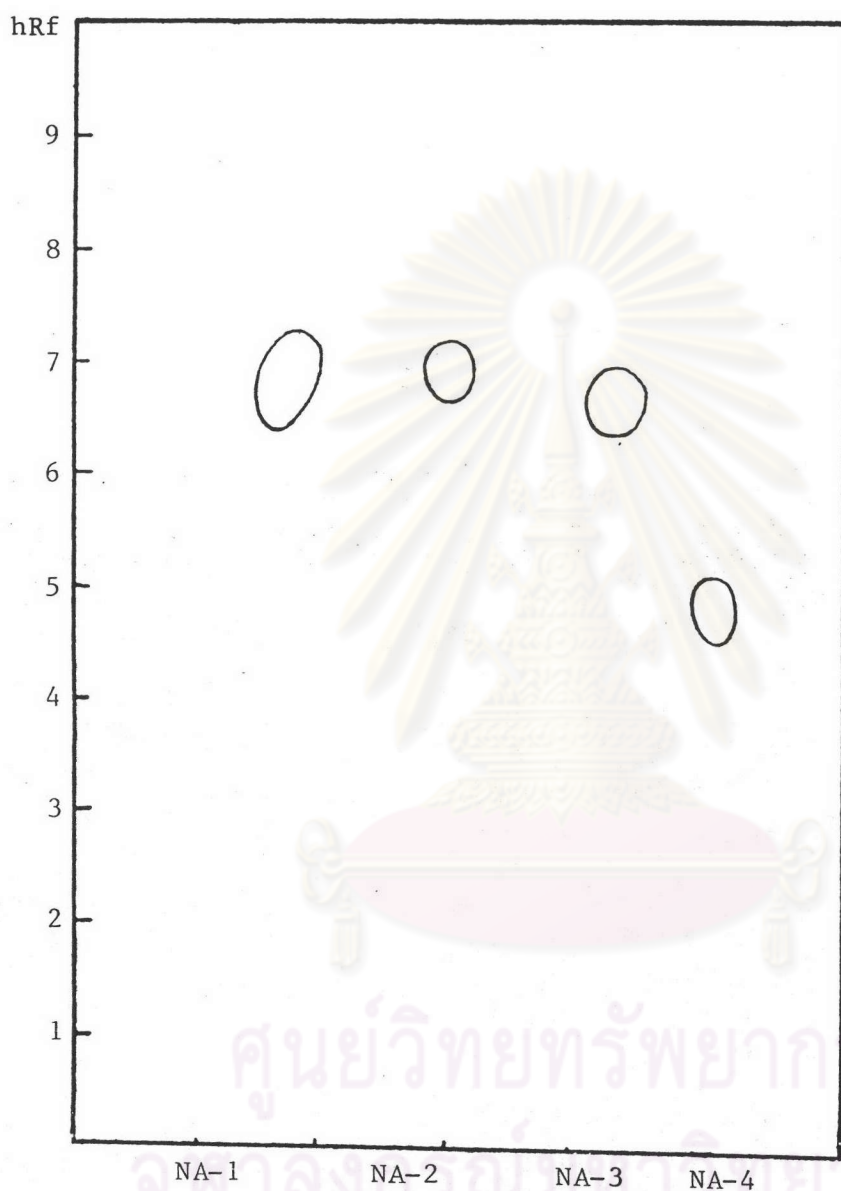


Figure 18 Thin layer chromatogram of alkaloids NA-1 (isolated isoboldine), NA-2 (isolated bisnorargemonine), NA-3 (isolated norcinnamolaurine) and NA-4 (isolated reticuline)

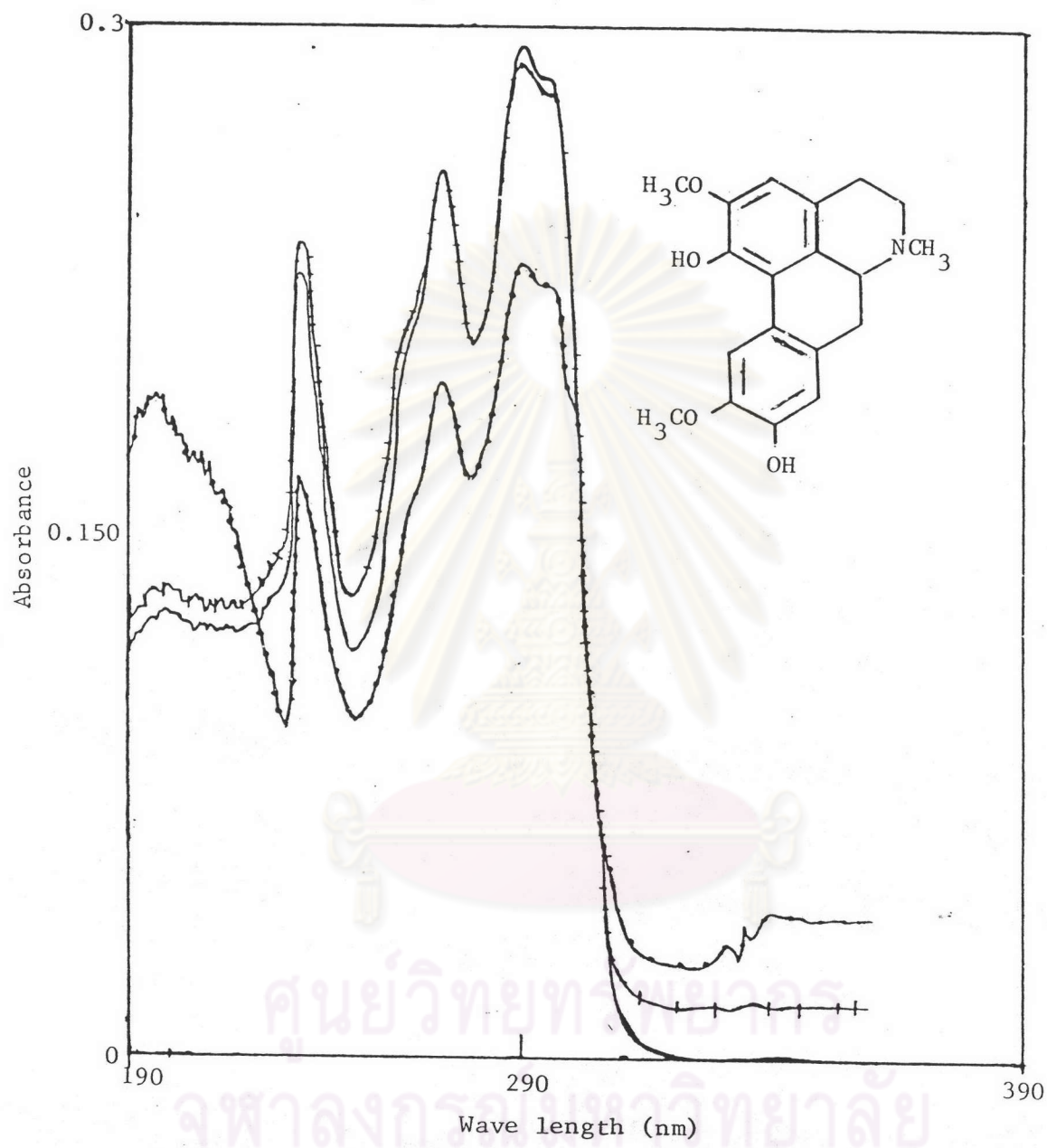


Figure 19 Ultraviolet absorption spectrum of alkaloid NA-1
(isolated isoboldine)

- in chloroform
- in chloroform
- +— in chloroform + sodium hydroxide

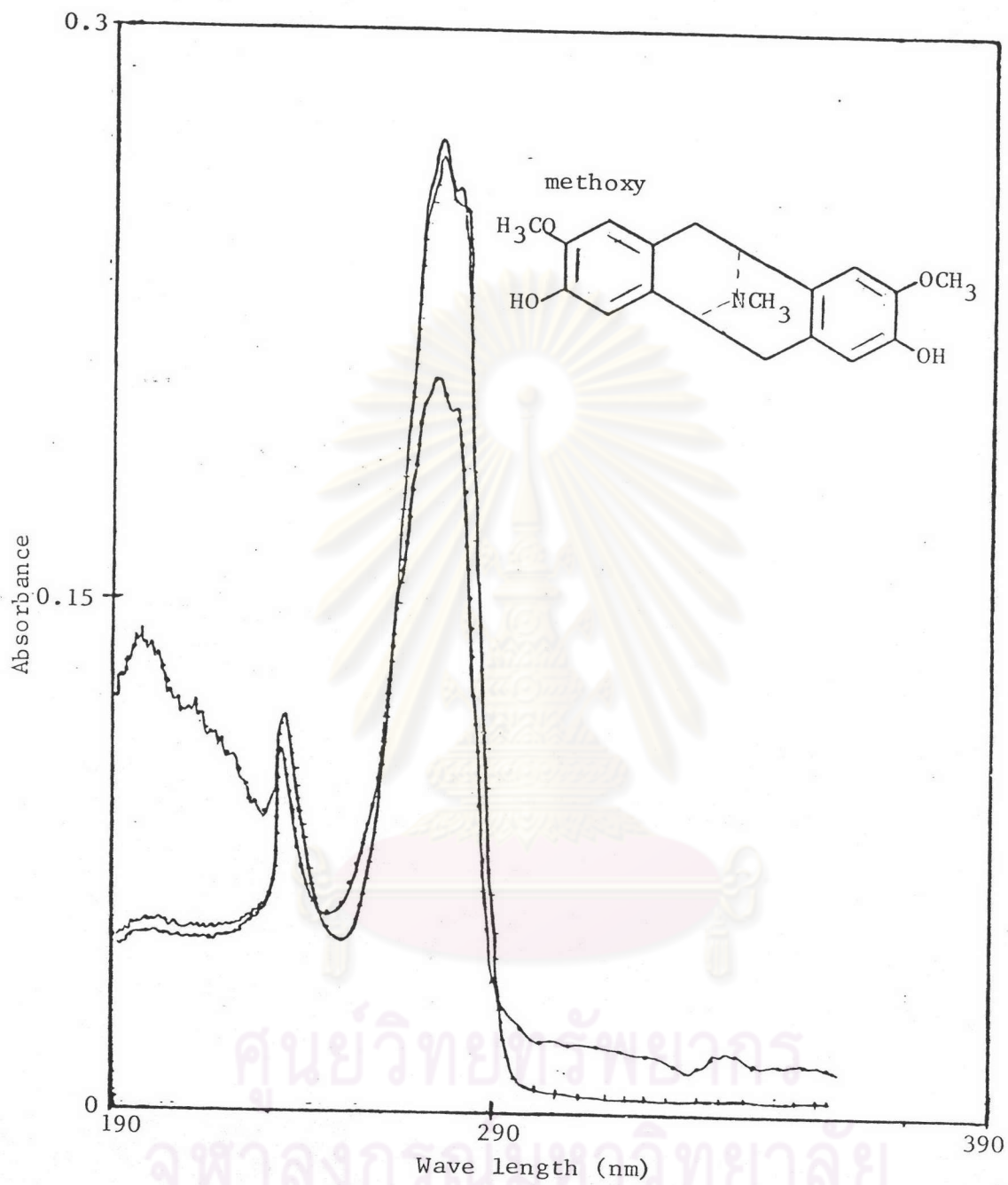


Figure 20 Ultraviolet absorption spectrum of alkaloid NA-2
(isolated bisnorargemonine)

- in chloroform
- in chloroform + hydrochloric acid
- +— in chloroform + sodium hydroxide

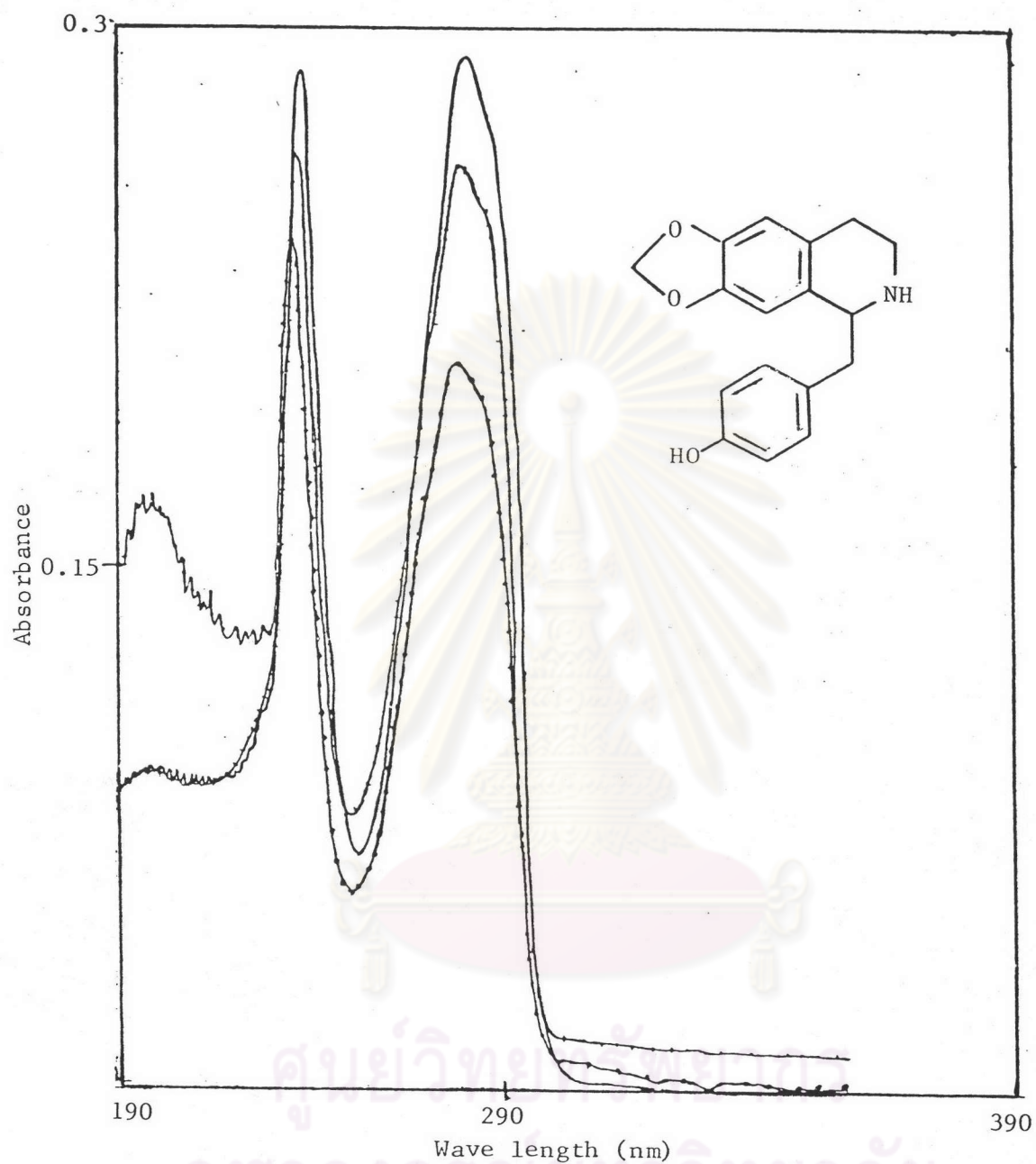


Figure 21 Ultraviolet absorption spectrum of alkaloid NA-3
(isolated norcinnamolaurine)

- in chloroform
- in chloroform + hydrochloric acid
- +++ in chloroform + sodium hydroxide

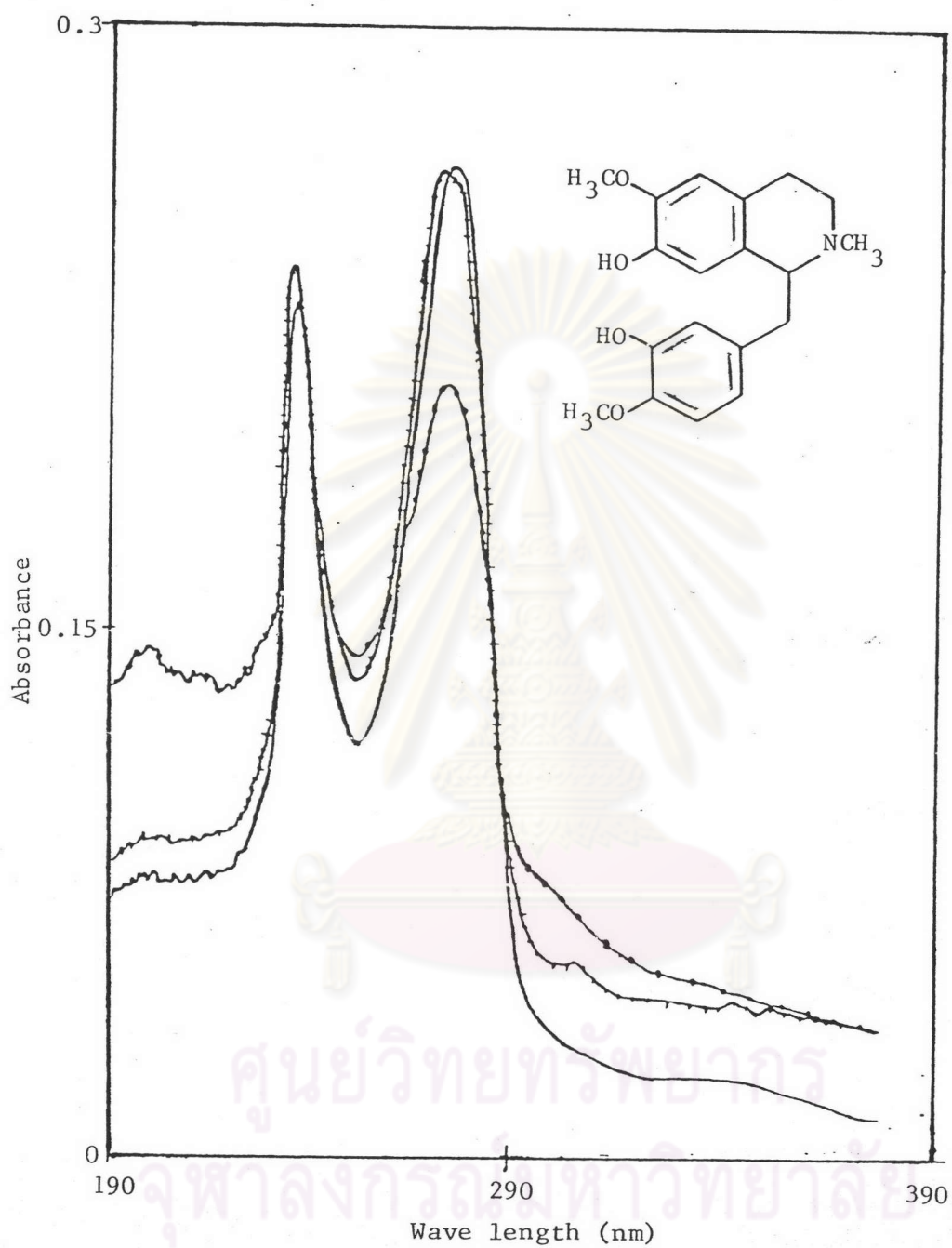


Figure 22 Ultraviolet absorption spectrum of alkaloid NA-4
(isolated reticuline)

- in chloroform
- ◆ in chloroform + hydrochloric acid
- ⊕ in chloroform + sodium hydroxide

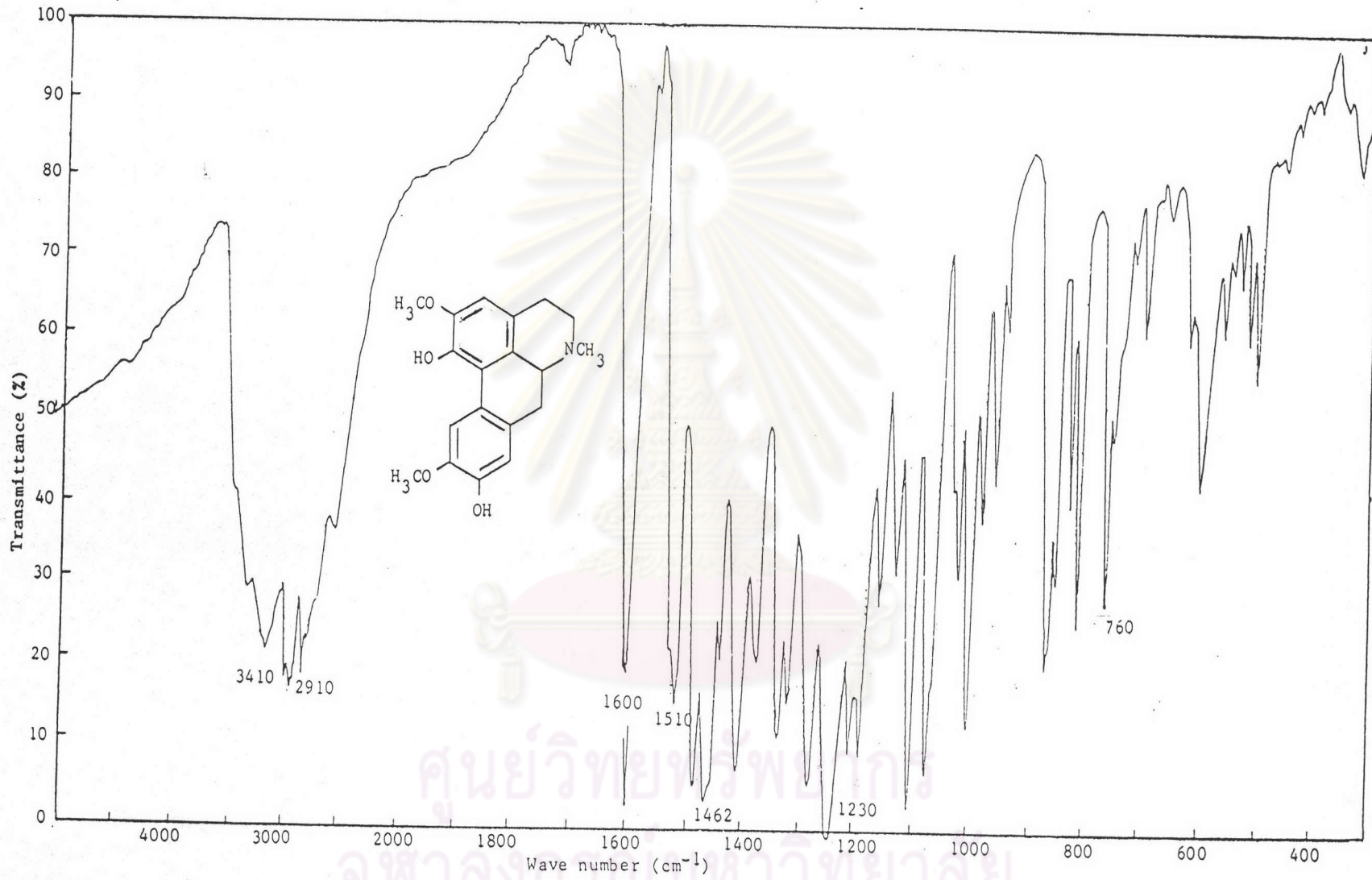


Figure 23 Infrared absorption spectrum of NA-1 (isolated isoboldine)

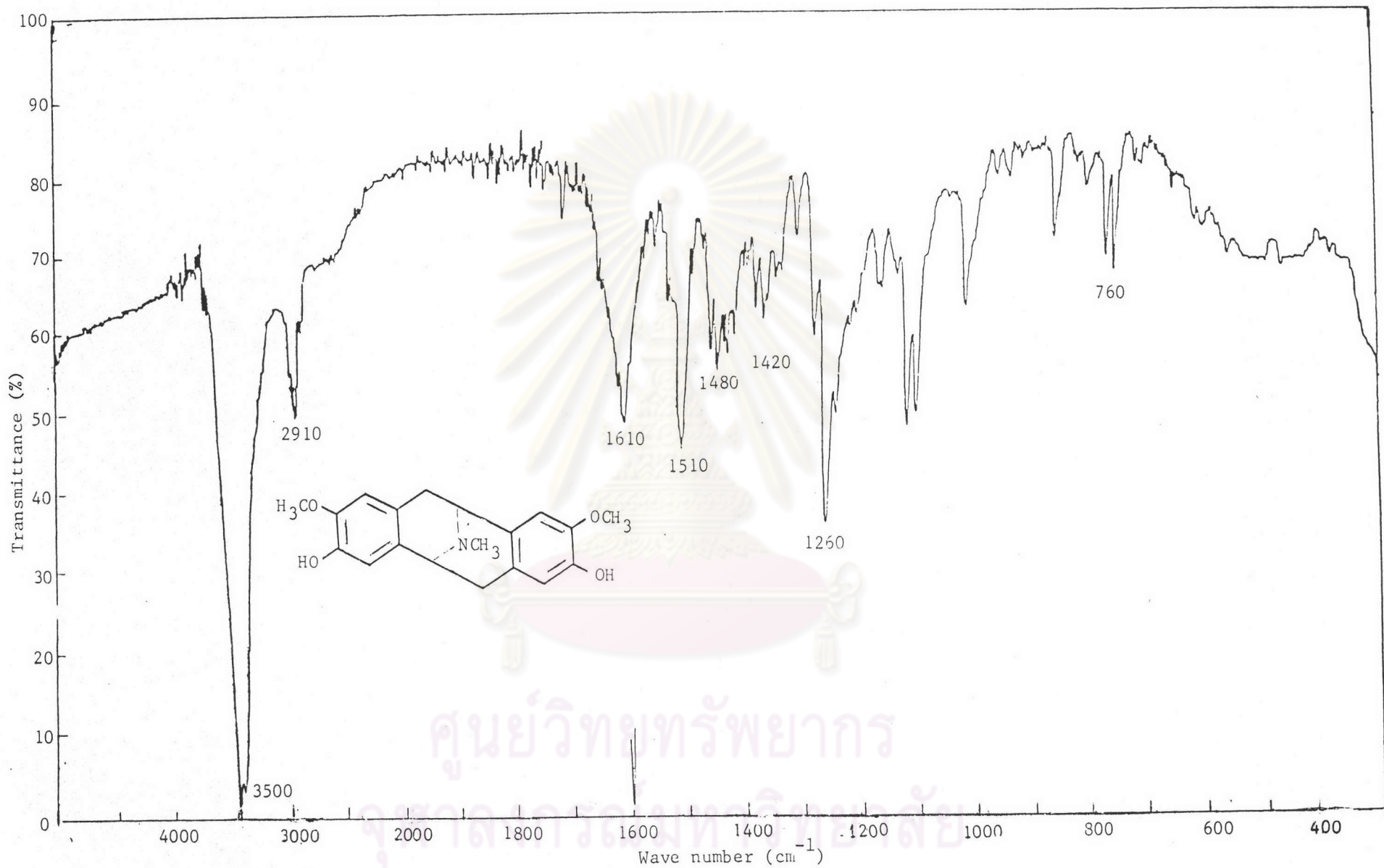


Figure 24 Infrared absorption spectrum of NA-2 (isolated bisnorargemonine)

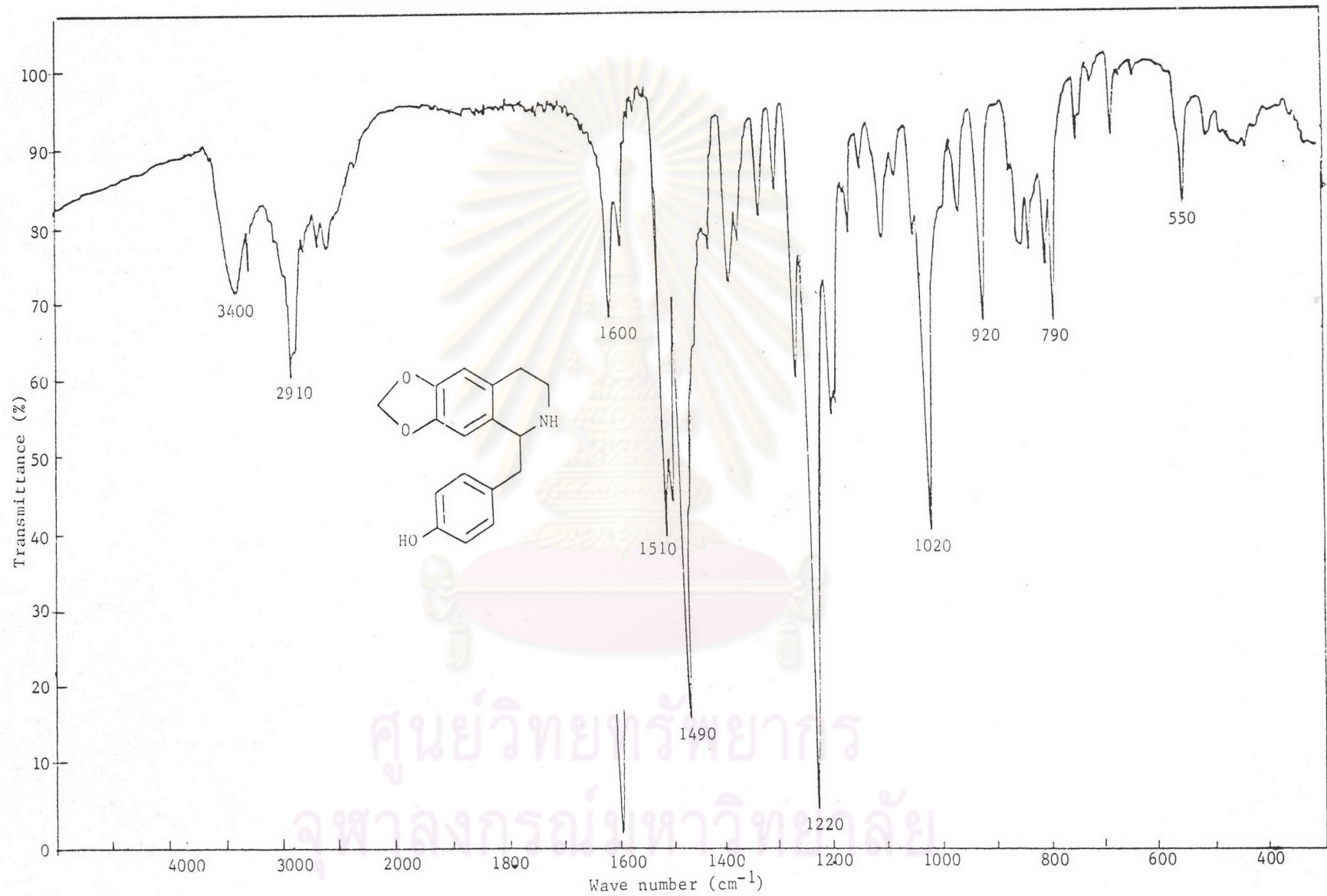


Figure 25 Infrared absorption spectrum of NA-3 (isolated norcinnamolaurine)

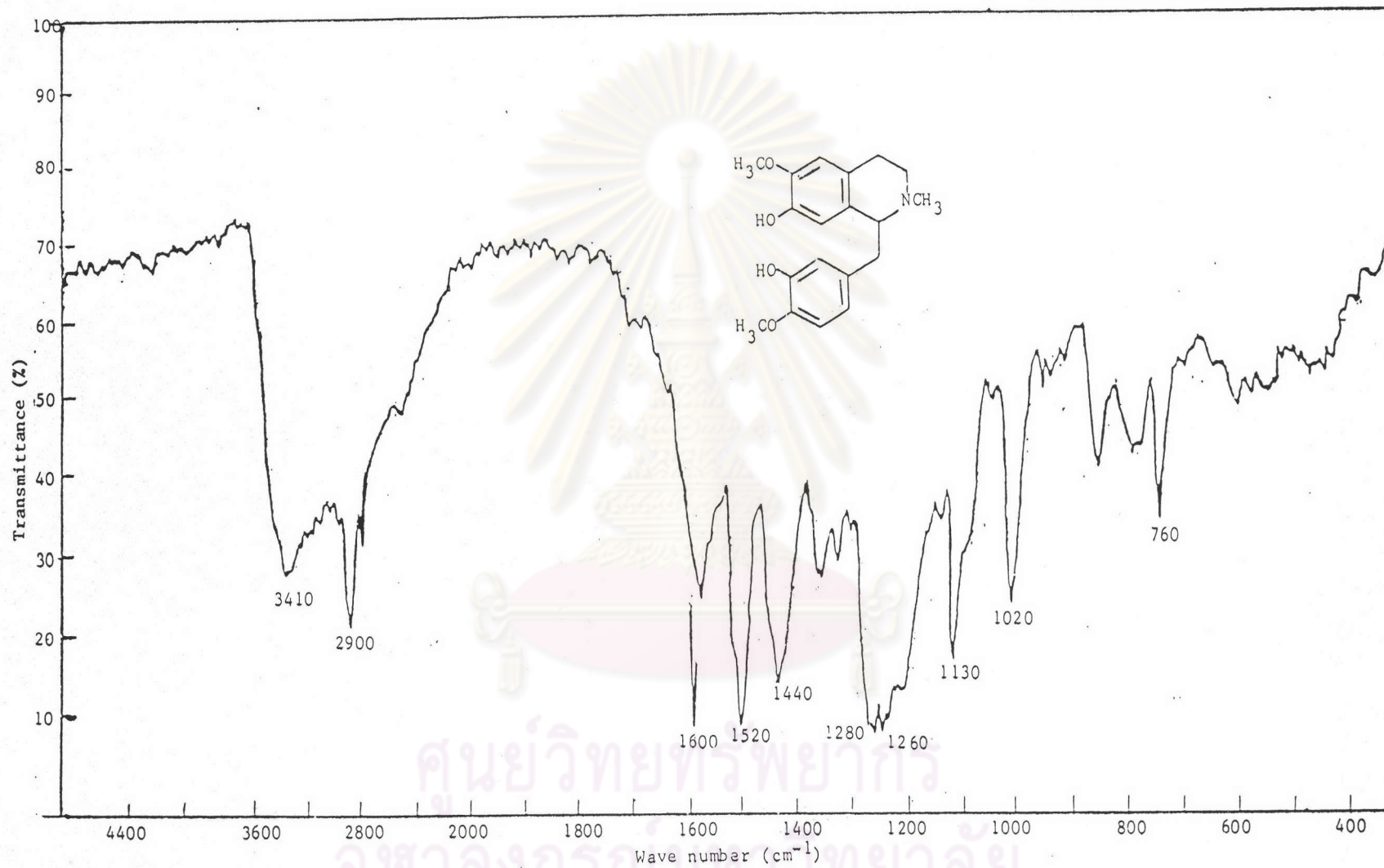


Figure 26 Infrared absorption spectrum of NA-4 (isolated (+)-reticuline)

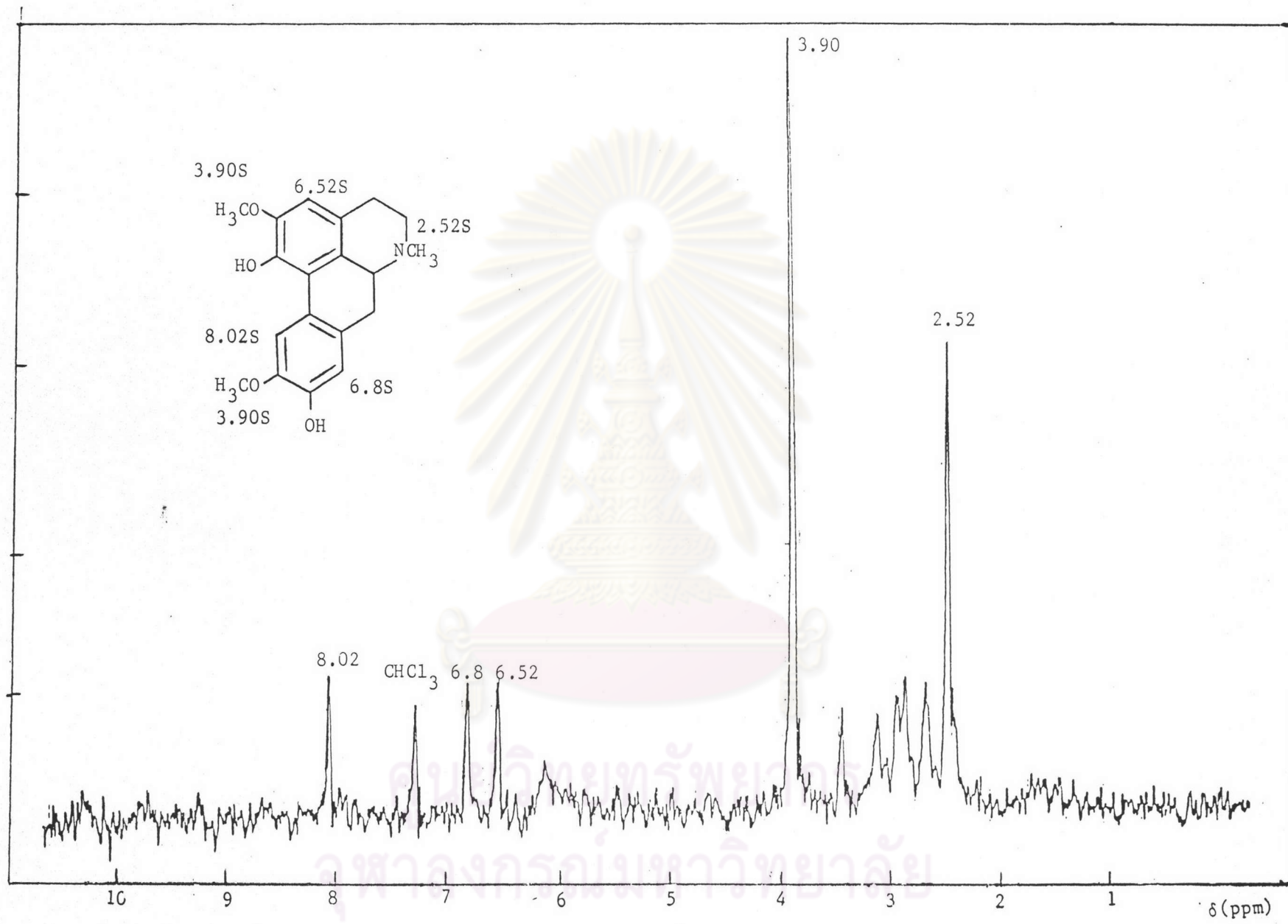


Figure 27 Nuclear magnetic resonance of NA-1 (isolated isoboldine)

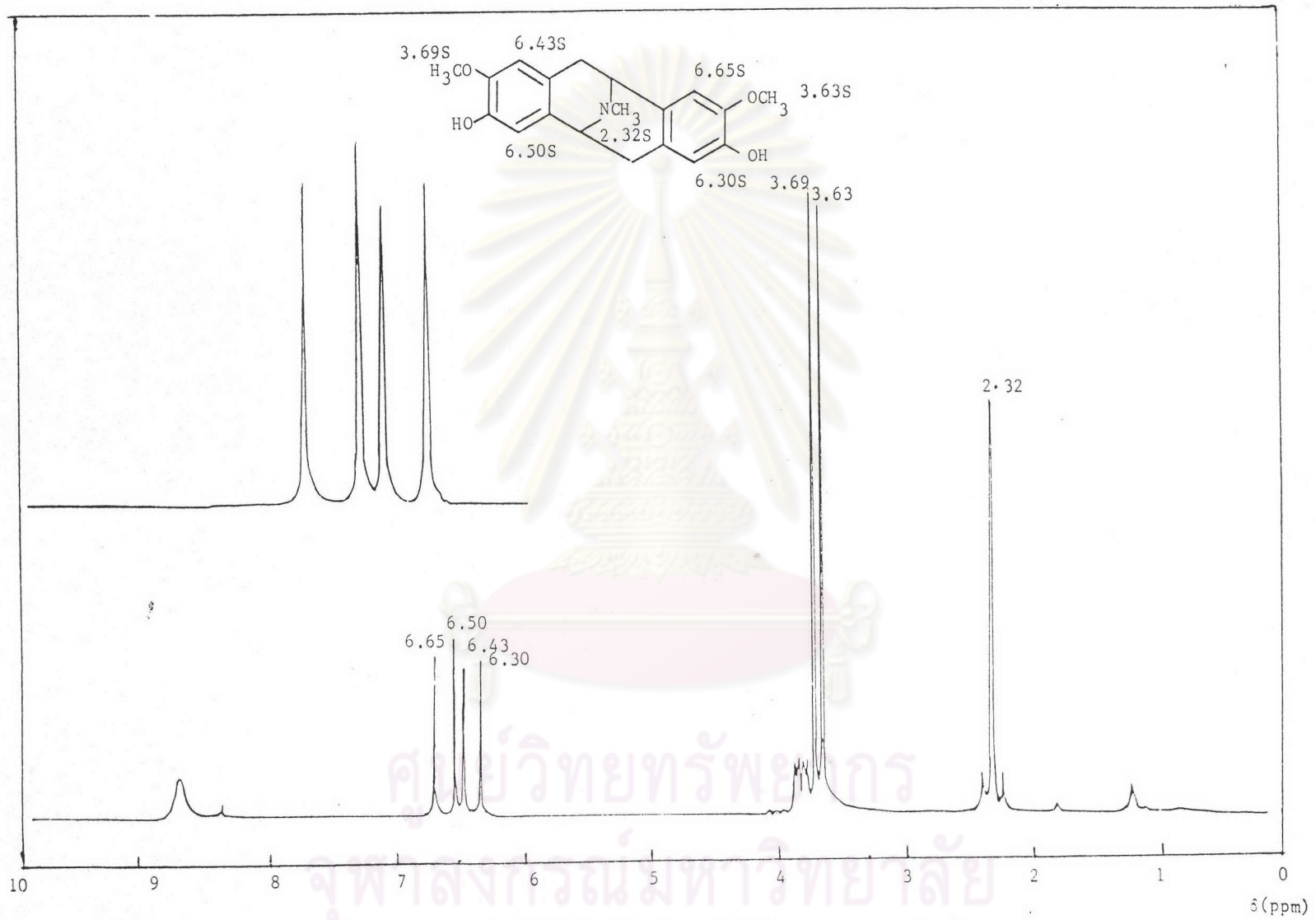


Figure 28 Nuclear magnetic resonance of NA-2 (isolated bisnorargemonine)

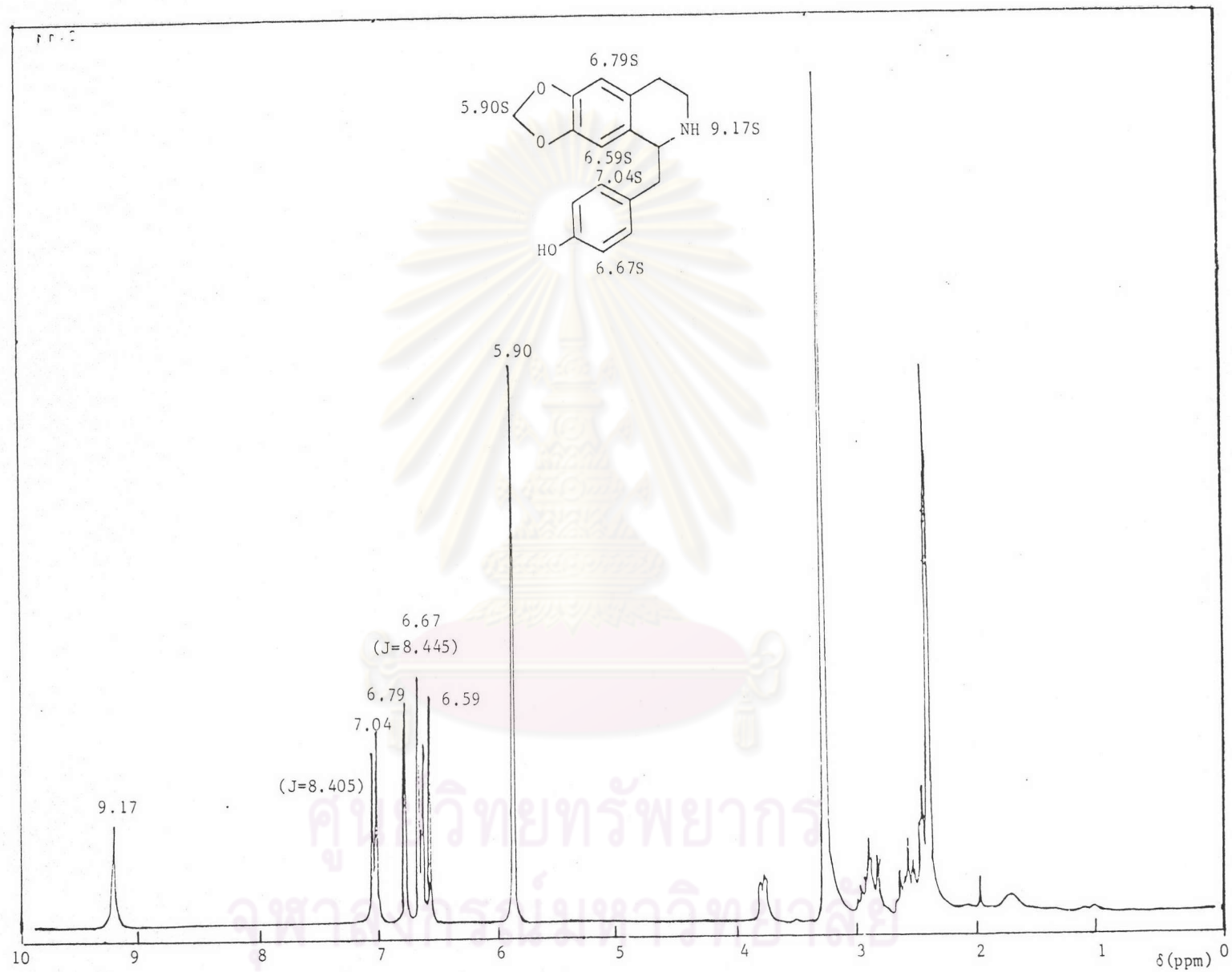


Figure 29 Nuclear magnetic resonance of NA-3 (isolated norcinnamolaurine)

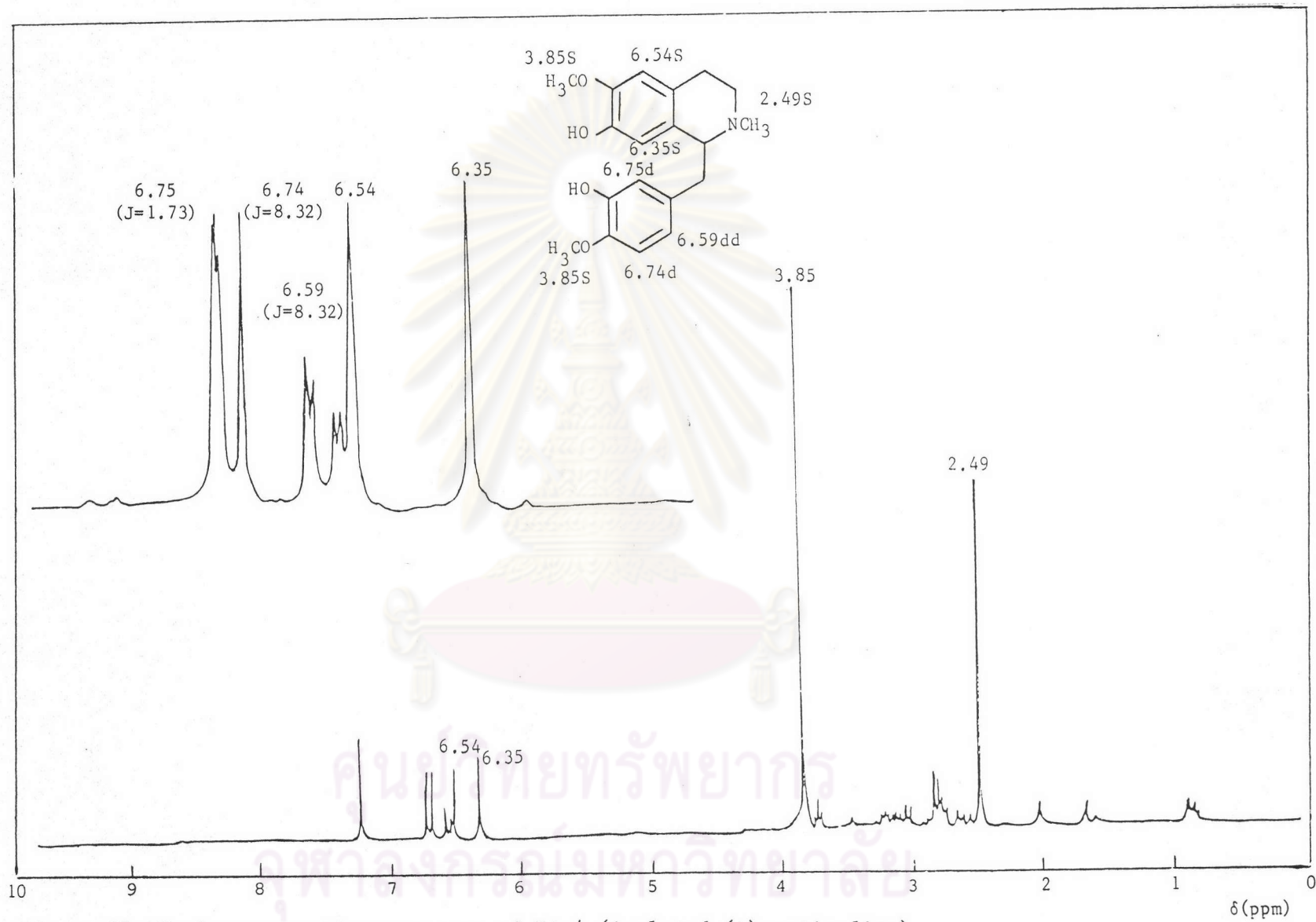


Figure 30 Nuclear magnetic resonance of NA-4 (isolated (+)-reticuline)

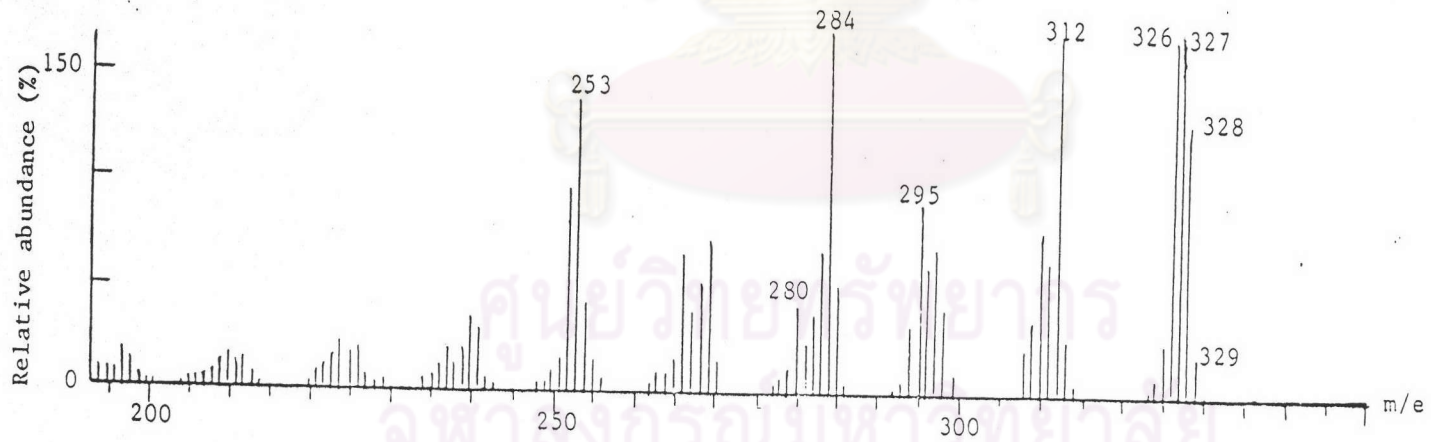
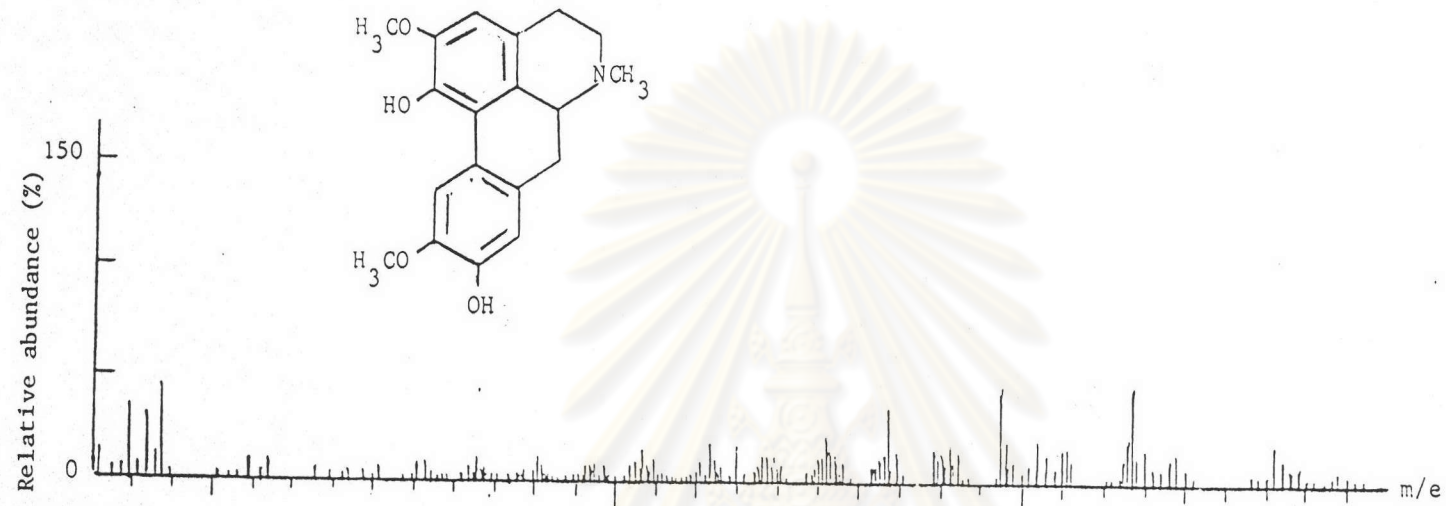


Figure 31 Mass spectrum of NA-1 (isolated isoboldine)

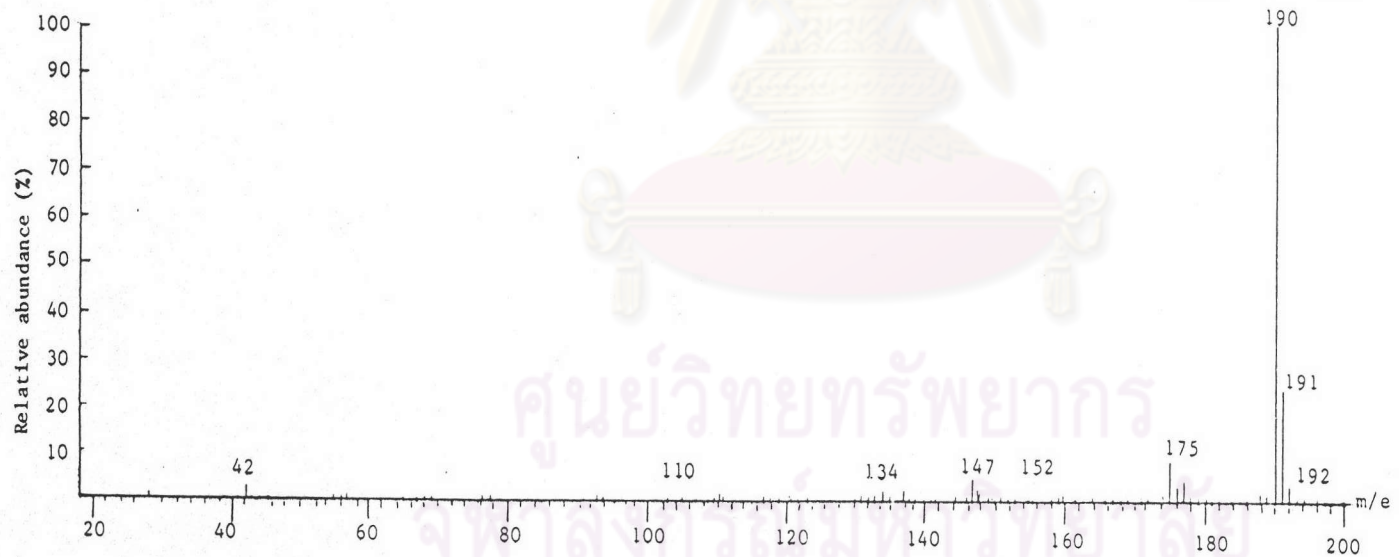
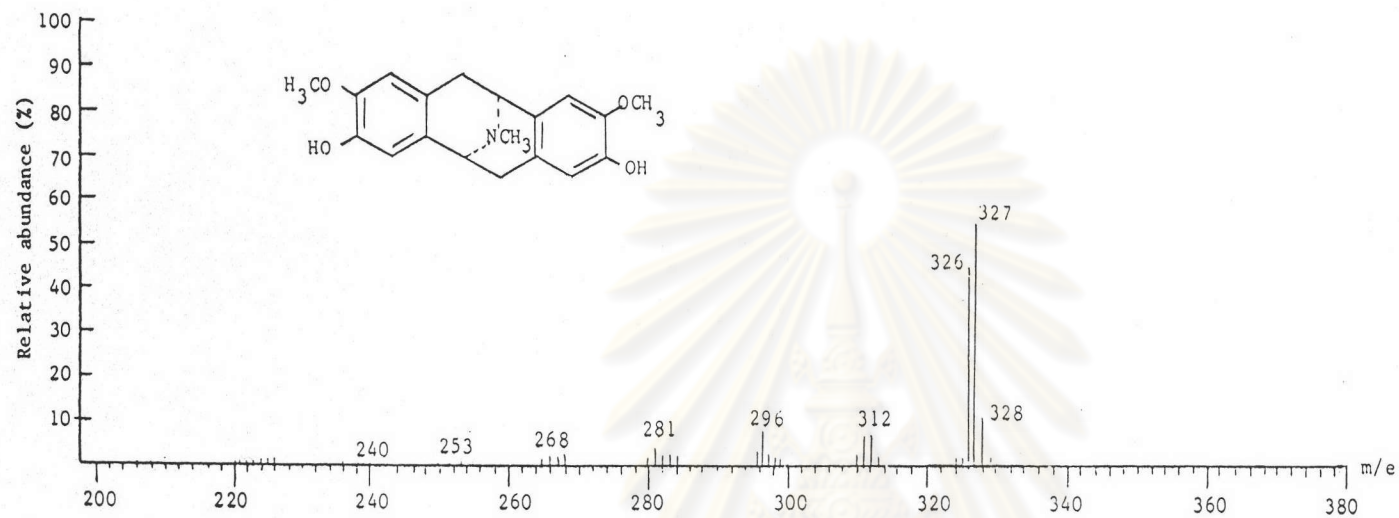


Figure 32 Mass spectrum of NA-2 (isolated bisnorargemonine)



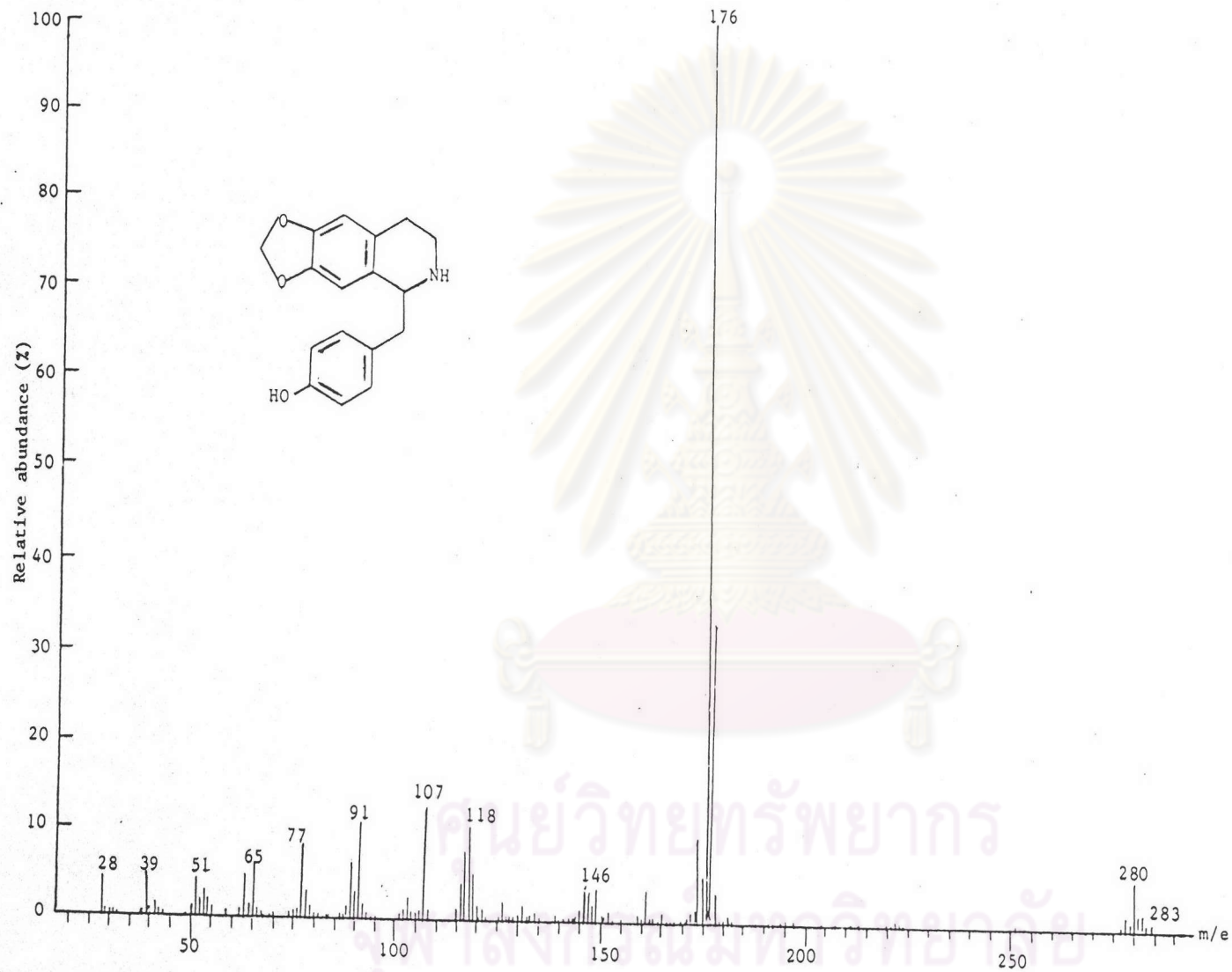


Figure 33 Mass spectrum of NA-3 (isolated norcinnamolaurine)

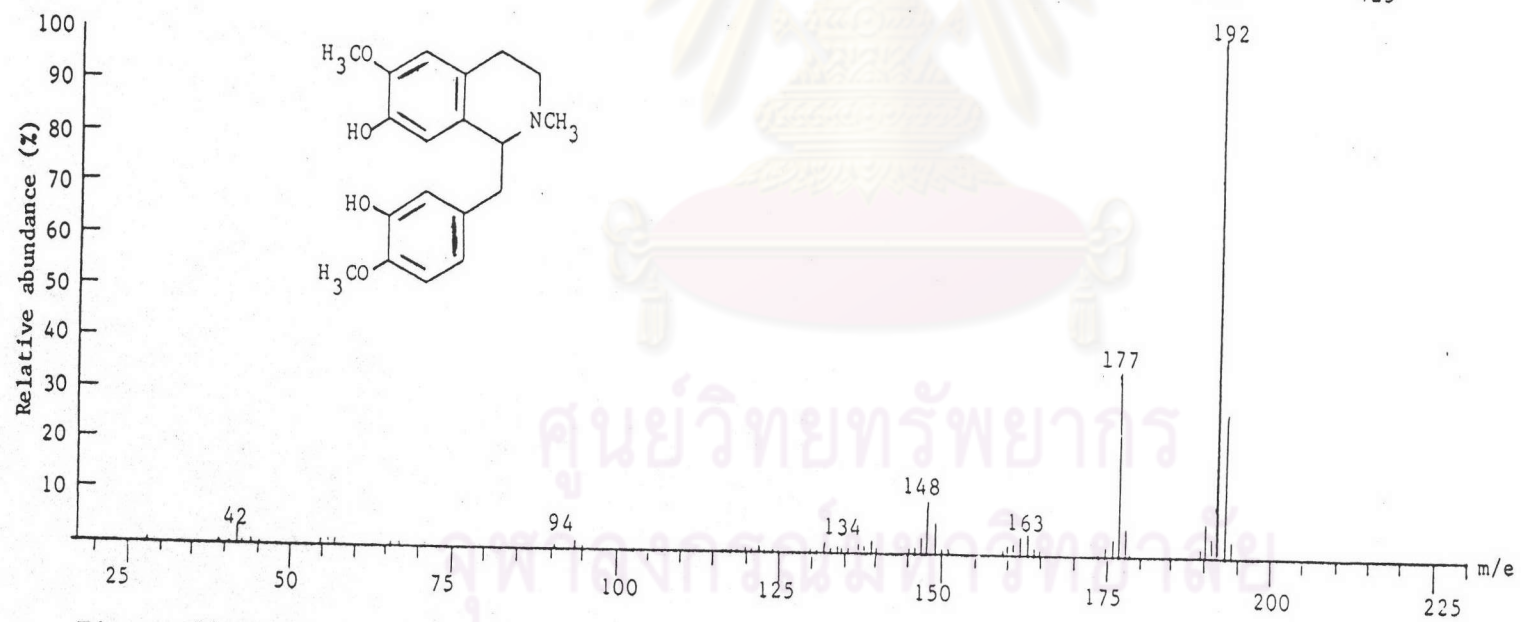
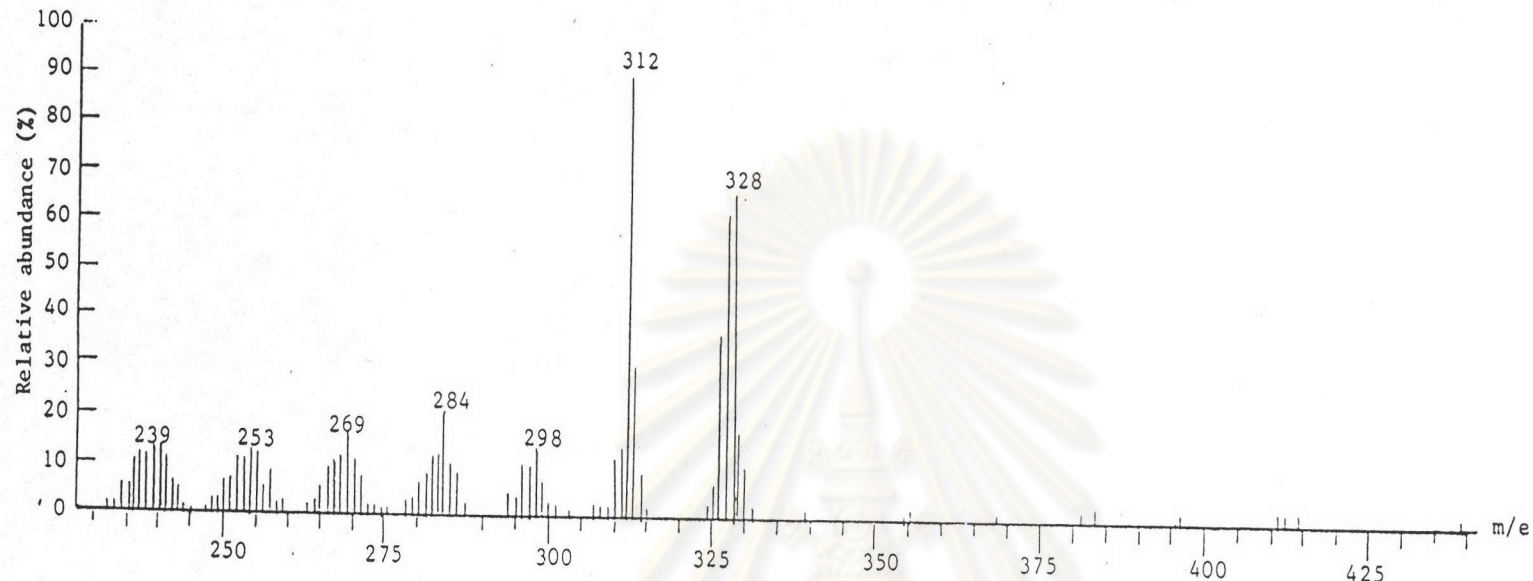


Figure 34 Mass spectrum of NA-4 (isolated reticuline)

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