Determination of Tetrahydropapaveroline by Microbore LCEC

Purpose

Develop a sensitive LCEC method, which can easily quantitate low level tetrahydropapaveroline (**F1**).

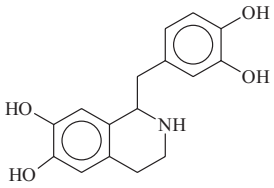

Figure 1. Structure of THP

Tetrahydropapaveroline (THP) has been of particular interest because it was shown to be a precursor of morphine in the poppy plant (1), to exert marked behavioral effects with respect to alcohol preferences in rats (2) and has been detected in the urine of Parkinsonian patients on L-dopa medication (3).

Existing Methods

Various analytical methods, including LCEC (2,4) and GC-MS (5) are available for the determination of THP. However, we wanted to develop an LCEC method by using a microbore column for high sensitivity. The following LCEC method is relatively simple, rapid, and highly sensitive.

LCEC Conditions

System: BAS 480e system equipped with BAS epsilon EC detector
Electrode: glassy carbon (3 mm)
Potential: +700 mV vs. Ag/AgCl
Column: UniJet, ODS, 3µm, 100 x 1 mm (BAS, P/N MF-8949)
Mobile Phase: Buffer of 1L (14.5 mM NaH_2PO_4, 30 mM sodium citrate, 27 µM disodium-EDTA, 10 mM diethylamine· HCl, 2.2 mM octyl sulfate, sodium salt), pH to 3.2 with H_3PO_4; 100 mL methanol; 80 mL dimethylacetamide.
Flow Rate: 100 µL/min
Amount Injected: 10 µL
Temperature: 35°C

Note

Representative chromatogram of tetrahydropapaveroline standard is shown in **F2**. The retention time is less than three minutes, which makes it possible to process ca. 20 samples and standards in one hour if no late eluting detectable substances are present.

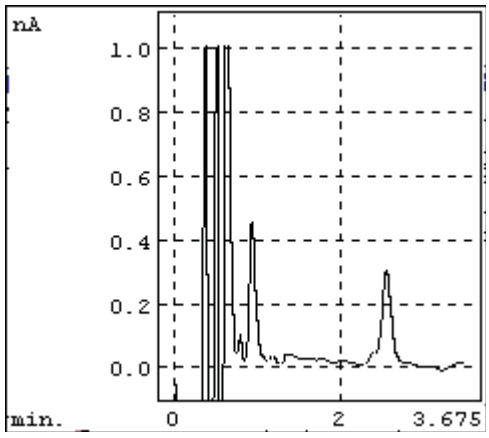

Figure 2. Chromatogram of THP (10 pg)

F3a and **F3b** are the calibration curves of THP standard at the ranges of 0-200 pg and 0-100pg, respectively. The detection limit was 1 pg on column.

References

1. Heikkila R., Cohen G., and Dembiec D., J. Pharmacol. Exp. Ther., 179 (1972) 250-258.
2. Cashaw J.L., Alcohol, 10 (1993) 133-138.
3. Matsubara K., Fukushima S., Akne A., Kobayashi S., and Shiono H., J. Pharmacol. Exp. Ther., 260 (1992) 974-260.
4. Sango K., Maruyama W., Matsubara K., Dostert P., Minami C., Kawai M., Naoi M., Neurosci. Letters, 283 (2000) 224-226.
5. Haber H., Roske I., Rottmann M., Georgi M., and Melzig M.F., Life Sci., 60 (1997) 79-89.

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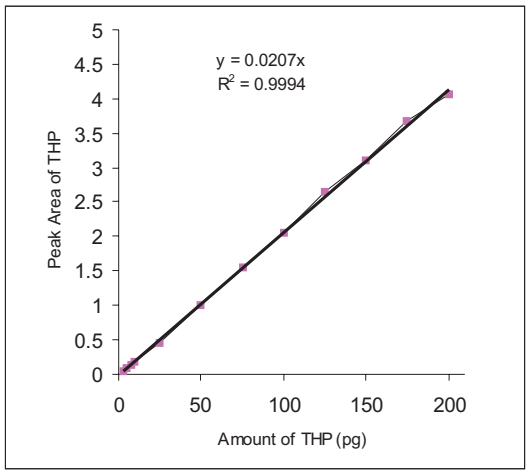

Figure 3a. Calibration curve of THP (0 - 200 pg)

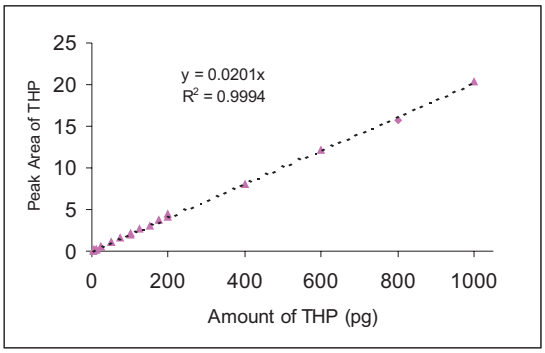

Figure 3b. Calibration curve of THP (0 - 1000 pg)