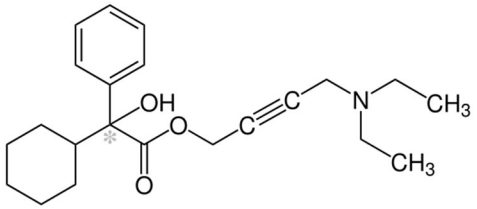
Oxybutynin
15 mg Tablet

Structure:



Molecular Formula and Mass: $C_{22}H_{31}NO_3$ – 357.494
Category: Bladder relaxant
Sample:

Grind one tablet and dissolve in 10.0 mL of methanol. Shake for at least 10 min and filter. Final concentration of sample solutions is 1.50 mg/mL, which is the required concentration representing 100%.

Standards:

Because the standard is in the chloride form, a conversion factor of 357.494 (molecular weight of oxybutynin) ÷ 393.952 (molecular weight of oxybutynin chloride) = 0.907 was applied when calculating the concentration of the standard.

High Standard:

The high limit is 115%; therefore the concentration of the high standard is 1.50 mg/mL × 115% = 1.73 mg/mL. Weigh approximately 47.6 mg of standard (equivalent to 47.6 mg × 0.907 = 43.2 mg oxybutynin) and dissolve it in 25.0 mL of methanol. If you weighed 47.7 mg of standard, dissolve it in: 47.7 mg × 0.907 ÷ 1.73 mg/mL = 25.0 mL of methanol. This makes the high standard solution concentration equal to 1.15 mg/mL, which is 115%.

Low Standard:

The low limit is 85%; therefore the concentration of the low standard = 1.50 mg/mL × 85% = 1.28 mg/mL. Dilute 1.70 mL of high standard to 2.30 mL by adding 0.60 mL of methanol. This gives a concentration of 1.73 mg/mL × 1.70 mL ÷ 2.30 mL = 1.28 mg/mL, which is 85%.

Spotting:

Spot on the 5 × 10 cm silica gel TLC aluminum plate with 3.00 µL aliquots as follows:

Left spot	low standard (85%) = 3.84 µg
Center Spot	100% sample = 4.50 µg
Right Spot	high standard (115%) = 5.19 µg

Development:

Mix 10.0 mL of toluene, 6.00 mL of ethyl acetate, and 12.0 mL of acetic acid. Develop the plate in a small glass chamber with approximately 20.0 mL of this solution until the solvent front reaches within 1 cm of the top of the TLC plate.

(R_f = 0.42)

Heating:

Heat the TLC plate on a hotplate to induce quenching of the fluorescent indicator in the silica gel F_{254} layer by the drug spots due to thermochemical activation.

Detection:

UV: Observe the plate under UV light at 254 nm. Observe the intensities and sizes of spots.

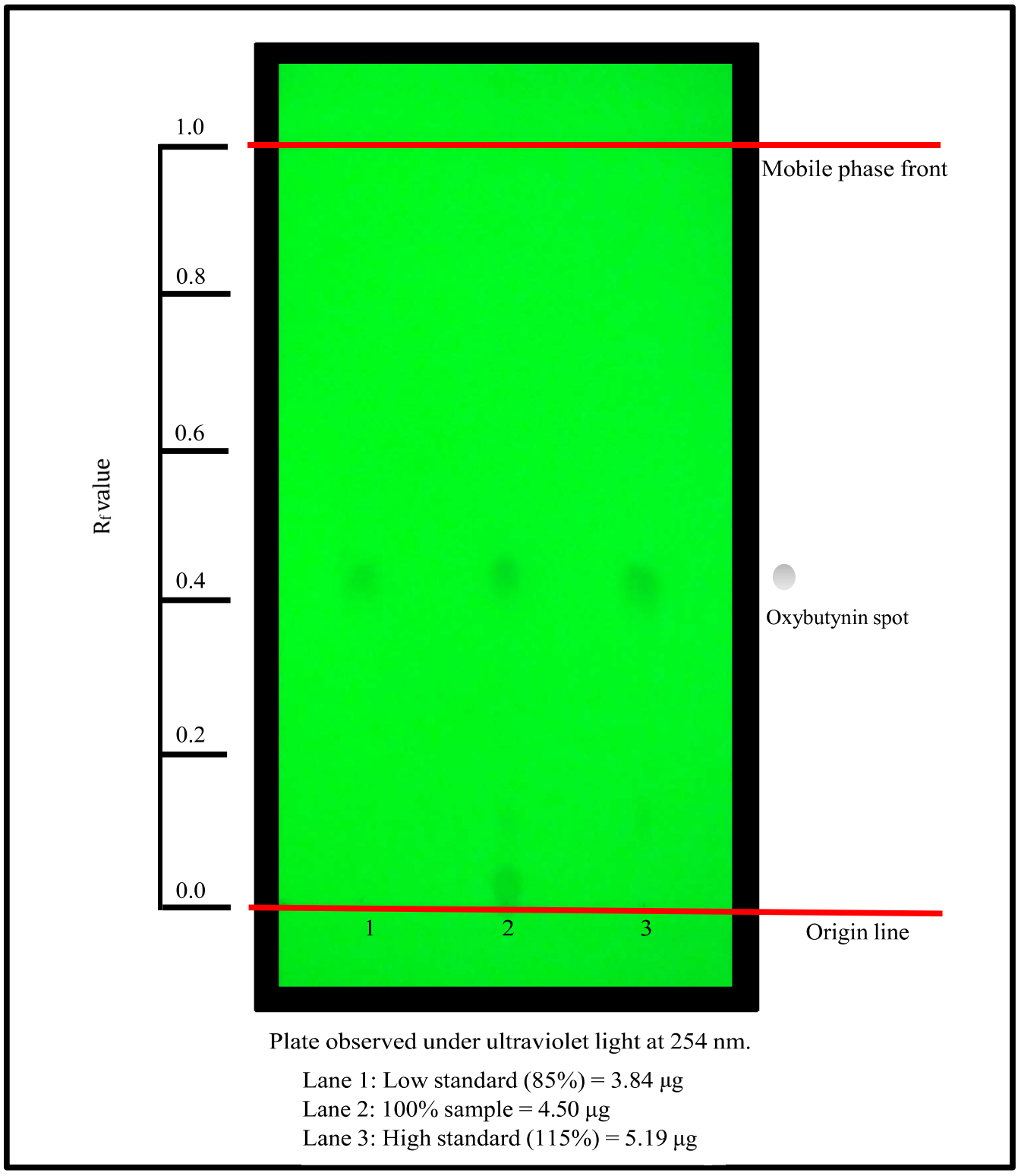


Plate observed under ultraviolet light at 254 nm.

Lane 1: Low standard (85%) = 3.84 µg
Lane 2: 100% sample = 4.50 µg
Lane 3: High standard (115%) = 5.19 µg

Developed and tested by Bingsong Zeng and Joseph Sherma
Department of Chemistry, Lafayette College, Easton, PA, USA
July, 2018
Bingsong Zeng's research was supported by the Lafayette College EXCEL Scholars Program