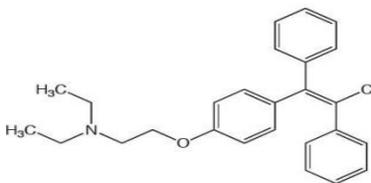


Clomiphene Citrate HCl
50 mg Tablet

Structure:



Molecular Formula and Mass: $C_{32}H_{36}ClNO_8$ – 598.1 g/mol

Category: Estrogen modulator

Sample:

Grind one tablet and dissolve in 10.0 mL of methanol. Shake for at least 10 min and filter: $50.0 \text{ mg}/10.0 \text{ mL} = 5.00 \text{ mg/mL}$. Dilute 2.00 mL with an additional 1.00 mL of methanol: $10.0 \text{ mg}/3.00 \text{ mL} = 3.33 \text{ mg/mL}$. Dilute 1.00 mL of the solution with 3.00 mL: $3.33 \text{ mg}/4.00 \text{ mL} = 0.833 \text{ mg/mL}$, Final concentration of the sample solution is 0.833 mg/mL, which is the required concentration representing 100%.

High Standard:

The high limit is 115%; therefore the concentration of the high standard is $0.833 \text{ mg/mL} \times 115\% = 0.958 \text{ mg/mL}$. Weigh approximately 95.8 mg of standard and dissolve it in 100 mL of methanol. This makes the high standard solution concentration equal to 0.958 mg/mL, which is 115%.

Low Standard:

The low limit is 85%; therefore the concentration of the low standard = $0.833 \text{ mg/mL} \times 85\% = 0.708 \text{ mg/mL}$. Dilute 1.70 mL of high standard to 2.30 mL by adding 0.60 mL of methanol. This gives a concentration of $0.958 \text{ mg/mL} \times 1.70 \text{ mL} \div 2.30 \text{ mL} = 0.708 \text{ mg/mL}$, which is 85%.

Spotting:

Spot on the $5 \times 10 \text{ cm}$ silica gel TLC aluminum plate with 3.00 μL aliquots as follows:

Left spot	low standard (85%) = 2.12 μg
Center Spot	100% sample = 2.50 μg
Right Spot	high standard (115%) = 2.87 μg

Development:

Mix 14.0 mL of methanol, 5.00 mL of ethyl acetate, and 1.00 mL of glacial acetic acid. Develop the plate in a small glass chamber with this solution until the solvent front reaches within 1 cm of the top of the TLC plate. Dry the plate for around 10 minutes.

($R_f = 0.29$)

Detection:

UV:

Dry the plate and observe under ultraviolet light at 254 nm. Observe the intensities and the sizes of the spots.

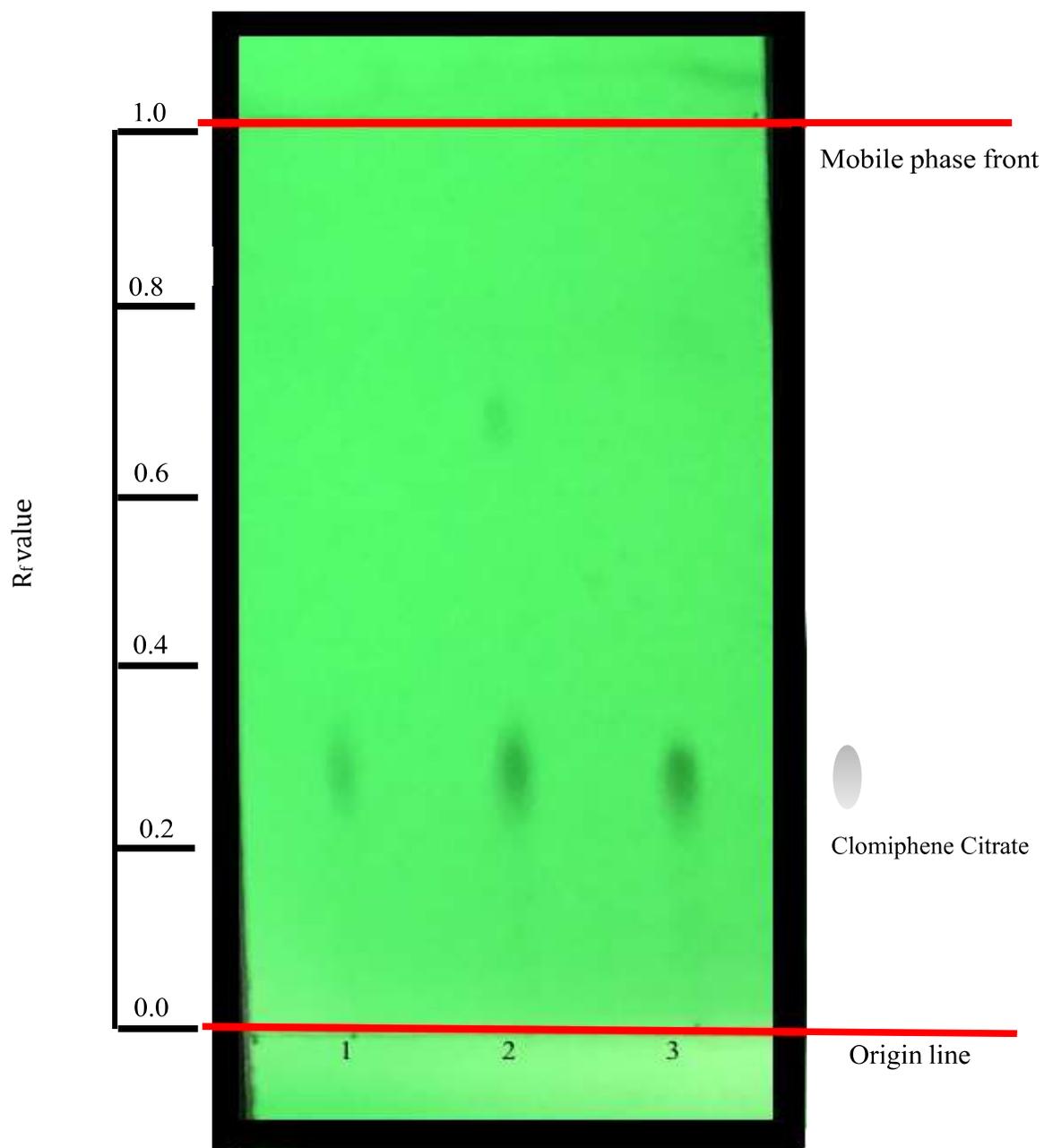


Plate observed under ultraviolet light at 254 nm.

Lane 1: Low standard (85%) = 2.12 μg

Lane 2: 100% sample = 2.50 μg

Lane 3: High standard (115%) = 2.87 μg

Developed and tested by Huong Tra My (Masha) Nguyen and Joseph Sherma

Department of Chemistry, Lafayette College, Easton, PA, USA

August 2019

Masha Nguyen's research was supported by Lafayette College EXCEL Scholars Program