Lab 7: Analysis of Caffeine in an OTC Analgesic by HPLC

Questions

1. Performing linear regression on the peak area from our caffeine standard calibration curve yields a slope of 11169.7 AU/µL stock solution and a y-intercept of 70876.1 AU. Our area for the peak corresponding to caffeine for anacin had an area of 3228713 AU, which corresponds to 282.714 µL stock solution on the calibration curve. Some simple dimensional analysis yields that $\frac{282.714 \ \mu L \text{ stock solution}}{1000 \mu L \text{ anacin solution}} * 250$ mL anacin solution $= \frac{1}{4} * 282.714$ mL stock solution $= \frac{1}{4} * 282.714$ mL stock solution $* \frac{12.4 \text{ mg caffeine}}{25 \text{ mL stock solution}} = 35.1$ mg caffeine in the anacin tablet.

2. The sample was 507.6 mg, so the tablet is 6.91% caffeine w/w.

3. N/A, only one replicate

4. Result seems reasonably close to the expected value of 32 mg.

Lab Notebook

Objective: Use HPLC to quantify aspirin and caffeine in an Anacin tablet

Procedure:

(caffeine stand solutions)

stock soln: 12.5 mg caffeine in 25 mL v.f.
1 mL with HPLC water

took standards, with
80 µL, 150 µL, 200 µL, and
300 µL of stock, rest HPLC water

Analgesic Mixture

- One Anacin tablet was ground to a fine powder
- dissolved in HPLC water with sonicator
- After a large amnt had dissolved, 250 mL flask filled with HPLC water
- Transferred through nylon syringe filter before being aliquotted into autosampler vials

Aspirin standard: 1.5 mL @ 0.0010 g/mL (premade)

Ottaus PR series - 0.0124 g caffeine Flinn Lot 92331

used Fisher Brand #18 for micropipetting

Acculab Analyti Balance S/N 11904121
- 0.5076 g Anacin

HPLC

A6 - Blank
B1 - 80
B2 - 150
B3 - 200
B4 - 300
B5 - aspirin
B6 - anacin