• **Uniformity of Dosage Units ⟨905⟩**
Procedure for content uniformity
Solution A, Mobile phase, Codeine phosphate standard stock solution, Standard solution, Chromatographic system, and System suitability: Proceed as directed in the *Assay*.
Sample stock solution: Transfer 1 Tablet to a 100-mL volumetric flask. Add 75 mL of *Mobile phase*, and sonicate for 10 min. Dilute with *Mobile phase* to volume.
Sample solution: Dilute 5.0 mL of the *Sample stock solution* with *Mobile phase* to 50 mL, and pass a portion through a suitable filter of 1-µm pore size.
Analysis
Samples: *Standard solution* and *Sample solution*
Calculate the quantity, in mg, of acetaminophen ($C_8H_9NO_2$) in the Tablet taken:

$$\text{Result} = (r_U/r_S) \times C_S \times F$$

r_U = peak response of acetaminophen from the *Sample solution*
r_S = peak response of acetaminophen from the *Standard solution*
C_S = concentration of USP Acetaminophen RS in the *Standard solution* (mg/mL)
F = dilution volume, 1000 mL

Calculate the quantity, in mg/mL, of the labeled amount of codeine phosphate ($C_{18}H_{21}NO_3 \cdot H_3PO_4 \cdot {}^1/_2H_2O$) in the Tablet taken:

$$\text{Result} = (r_U/r_S) \times C_S \times (M_{r1}/M_{r2}) \times F$$

r_U = peak response of codeine from the *Sample solution*
r_S = peak response of codeine from the *Standard solution*
C_S = concentration of USP Codeine Phosphate RS in the *Standard solution* (mg/mL)
M_{r1} = molecular weight of codeine phosphate, 406.37
M_{r2} = molecular weight of anhydrous codeine phosphate, 397.37
F = dilution volume, 1000 mL

Acceptance criteria: Meet the requirements

IMPURITIES
• **4-Aminophenol in Acetaminophen-Containing Drug Products ⟨227⟩:** Meet the requirements

ADDITIONAL REQUIREMENTS
• **Packaging and Storage:** Preserve in tight, light-resistant containers, and store at controlled room temperature.
• **USP Reference Standards ⟨11⟩**
USP Acetaminophen RS
USP Codeine Phosphate RS

Acetaminophen, Dextromethorphan Hydrobromide, Doxylamine Succinate, and Pseudoephedrine Hydrochloride Oral Solution

DEFINITION
Acetaminophen, Dextromethorphan Hydrobromide, Doxylamine Succinate, and Pseudoephedrine Hydrochloride Oral Solution contains NLT 90.0% and NMT 110.0% of the labeled amount of acetaminophen ($C_8H_9NO_2$), dextromethorphan hydrobromide ($C_{18}H_{25}NO \cdot HBr \cdot H_2O$), doxylamine succinate ($C_{17}H_{22}N_2O \cdot C_4H_6O_4$), and pseudoephedrine hydrochloride ($C_{10}H_{15}NO \cdot HCl$).

IDENTIFICATION
• **A.** The retention time of the acetaminophen peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay* for *Acetaminophen*.
• **B.** The retention time of the dextromethorphan peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay* for *Dextromethorphan Hydrobromide*.
• **C.** The retention time of the doxylamine peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay* for *Doxylamine Succinate*.
• **D.** The retention time of the pseudoephedrine peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay* for *Pseudoephedrine Hydrochloride*.

ASSAY
• **Acetaminophen**
Mobile phase: Methanol and water (45:55)
Standard solution: 0.2 mg/mL of USP Acetaminophen RS in *Mobile phase*
Sample solution: Nominally 0.2 mg/mL of acetaminophen from a volume of Oral Solution in *Mobile phase* prepared as follows. Dilute a volume of Oral Solution, equivalent to about 200 mg of acetaminophen, in *Mobile phase*.
Chromatographic system
(See *Chromatography* ⟨621⟩, *System Suitability*.)
Mode: LC
Detector: UV 254 nm
Column: 4.6-mm × 25-cm; packing L1
Flow rate: 1 mL/min
Injection volume: 10 µL
System suitability
Sample: *Standard solution*
Suitability requirements
Tailing factor: NMT 2.0 for the acetaminophen peak
Relative standard deviation: NMT 2.0%
Analysis
Samples: *Standard solution* and *Sample solution*
Calculate the percentage of the labeled amount of acetaminophen ($C_8H_9NO_2$) in the portion of Oral Solution taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times 100$$

r_U = peak response of acetaminophen from the *Sample solution*
r_S = peak response of acetaminophen from the *Standard solution*
C_S = concentration of USP Acetaminophen RS in the *Standard solution* (mg/mL)
C_U = nominal concentration of acetaminophen in the *Sample solution* (mg/mL)

Acceptance criteria: 90.0%–110.0% of the labeled amount of acetaminophen ($C_8H_9NO_2$)
• **Dextromethorphan Hydrobromide**
Solution A: 6.8 g/L of monobasic potassium phosphate in water
Mobile phase: Acetonitrile and *Solution A* (45:55)
Standard solution: 0.1 mg/mL of USP Dextromethorphan Hydrobromide RS, 0.04 mg/mL of USP Doxylamine Succinate RS, and 0.2 mg/mL of USP Pseudoephedrine Hydrochloride RS in *Mobile phase*
Sample solution: Nominally 0.1 mg/mL of dextromethorphan hydrobromide from a volume of Oral Solution in *Mobile phase* prepared as follows. Dilute a volume of Oral Solution, equivalent to about 5 mg of dextromethorphan hydrobromide, in *Mobile phase*.