Chromatographic system
Developing solvent system: Methylene chloride and methanol (4:1)
Acceptance criteria: Meets the requirements

ASSAY
• **PROCEDURE**
Mobile phase: Methanol and water (1:3)
Standard solution: 0.01 mg/mL of USP Acetaminophen RS in *Mobile phase*
Sample stock solution: Dissolve 10 g of Acetaminophen for Effervescent Oral Solution in 200 mL of water in a 1000-mL volumetric flask, using gentle heat if necessary, until effervescence subsides, and then dilute with water to volume.
Sample solution: Nominally 0.16 mg/mL of acetaminophen in *Mobile phase* from the *Sample stock solution*. Pass a portion of this solution through a filter of 0.5-µm or finer pore size, discarding the first 10 mL of the filtrate.
Chromatographic system
(See *Chromatography* ⟨621⟩, *System Suitability*.)
Mode: LC
Detector: UV 243 nm
Column: 3.9-mm × 30-cm; packing L1
Flow rate: 1.5 mL/min
Injection volume: 10 µL
System suitability
Sample: *Standard solution*
Suitability requirements
Column efficiency: NLT 1000 theoretical plates
Tailing factor: NMT 2.0
Relative standard deviation: NMT 2.0%
Analysis
Samples: *Standard solution* and *Sample solution*
Calculate the quantity, in g, of acetaminophen ($C_8H_9NO_2$) in 100 g of Acetaminophen for Effervescent Oral Solution taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times (1/F_1) \times L \times F_2$$

r_U = peak response from the *Sample solution*
r_S = peak response 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)
F_1 = conversion factor, 1000 mg/g
L = label claim (mg/unit)
F_2 = conversion factor, 100, based on the label claim of g of acetaminophen per 100 g of sample
Acceptance criteria: 5.63–6.88 g

PERFORMANCE TESTS
• **MINIMUM FILL** ⟨755⟩: Meets the requirements for solids packaged in multiple-unit containers
• **UNIFORMITY OF DOSAGE UNITS** ⟨905⟩: Meets the requirements for solids packaged in single-unit containers

IMPURITIES
• **4-AMINOPHENOL IN ACETAMINOPHEN-CONTAINING DRUG PRODUCTS** ⟨227⟩: Meets the requirements

ADDITIONAL REQUIREMENTS
• **PACKAGING AND STORAGE:** Preserve in air-tight containers, and store at controlled room temperature.

• **USP REFERENCE STANDARDS** ⟨11⟩
USP Acetaminophen RS

Acetaminophen Suppositories

DEFINITION
Acetaminophen Suppositories contain NLT 90.0% and NMT 110.0% of the labeled amount of acetaminophen ($C_8H_9NO_2$).

IDENTIFICATION
• **A.** The retention time of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay*.
• **B. THIN-LAYER CHROMATOGRAPHIC IDENTIFICATION TEST** ⟨201⟩
Sample solution: Transfer the equivalent of 20 mg of acetaminophen from a portion of Suppositories to a beaker. Add 20 mL of methanol and heat on a steam bath until melted. Remove the beaker from the steam bath, allow to cool with occasional stirring, and filter. Use the clear filtrate.
Chromatographic system
Developing solvent system: Methylene chloride and methanol (4:1)
Acceptance criteria: Meet the requirements

ASSAY
• **PROCEDURE**
Mobile phase: Methanol and water (1:3)
Standard solution: 0.01 mg/mL of USP Acetaminophen RS in *Mobile phase*
Sample stock solution: Nominally 0.5 mg/mL of acetaminophen prepared as follows. Tare a small dish and a glass rod, place NLT 5 Suppositories in the dish, heat gently on a steam bath until melted, stir, cool while stirring, and weigh. Transfer a weighed portion of the mass, equivalent to 100 mg of acetaminophen, to a separator, add 30 mL of solvent hexane, and dissolve. Add 30 mL of water, shake gently, and allow the phases to separate. If an emulsion forms, allow sufficient time for it to separate. Transfer the aqueous layer to a 200-mL volumetric flask, and wash the solvent hexane in the separator with three 30-mL portions of water, adding the washings to the volumetric flask. Dilute with *Mobile phase* to volume.
Sample solution: Nominally 0.01 mg/mL of acetaminophen in *Mobile phase* from the *Sample stock solution*. Pass a portion of this solution through a filter of 0.5-µm or finer pore size, discarding the first 10 mL of the filtrate. Use the clear filtrate.
Chromatographic system
(See *Chromatography* ⟨621⟩, *System Suitability*.)
Mode: LC
Detector: UV 243 nm
Column: 3.9-mm × 30-cm; packing L1
Flow rate: 1.5 mL/min
Injection volume: 10 µL
System suitability
Sample: *Standard solution*
Suitability requirements
Tailing factor: NMT 2
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 Suppositories taken:

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

r_U = peak response from the *Sample solution*