$F$ = relative response factor for each impurity shown in *Table 3*

**Acceptance criteria:** See *Table 3*. [NOTE—The relative retention times and relative response factors in *Table 3* (where applicable) are calculated relative to those of acetaminophen related compound D.]

**Table 3**

| Name | Relative Retention Time | Relative Response Factor | Acceptance Criteria, NMT (%) |
|---|---|---|---|
| Acetaminophen | 0.43 | — | — |
| Acetaminophen related compound B[a] | 0.67 | 1.2 | 0.05 |
| Acetaminophen related compound C[b] | 0.71 | 0.38 | 0.05 |
| Acetaminophen related compound D[c] | 1.0 | 1.0 | 0.05 |
| Acetaminophen related compound J[d] | 1.73 | — | 0.001 |
| Individual unspecified impurity | — | 1.0 | 0.05 |
| Total impurities | — | — | 0.1 |

[a] *N*-(4-Hydroxyphenyl)propanamide.
[b] *N*-(2-Hydroxyphenyl)acetamide.
[c] *N*-Phenylacetamide.
[d] *N*-(4-Chlorophenyl)acetamide (*p*-chloroacetanilide).

## SPECIFIC TESTS

• **LOSS ON DRYING** ⟨731⟩
**Analysis:** Dry at 105° to constant weight.
**Acceptance criteria:** NMT 0.5%

## ADDITIONAL REQUIREMENTS

• **PACKAGING AND STORAGE:** Preserve in tight, light-resistant containers, and store at room temperature. Protect from moisture and heat.

• **USP REFERENCE STANDARDS** ⟨11⟩
USP Acetaminophen RS
USP Acetaminophen Related Compound B RS
*N*-(4-Hydroxyphenyl)propanamide.
$C_9H_{11}NO_2$ 165.19
USP Acetaminophen Related Compound C RS
*N*-(2-Hydroxyphenyl)acetamide.
$C_8H_9NO_2$ 151.16
USP Acetaminophen Related Compound D RS
*N*-Phenylacetamide.
$C_8H_9NO$ 135.17
USP Acetaminophen Related Compound J RS
*N*-(4-Chlorophenyl)acetamide (*p*-chloroacetanilide).
$C_8H_8ClNO$ 169.61
USP 4-Aminophenol RS
$C_6H_7NO$ 109.13

# Acetaminophen Capsules

## DEFINITION

Acetaminophen Capsules 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:** 1 mg/mL of acetaminophen prepared as follows. Triturate from contents of the Capsules in methanol. Filter, and 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:** Weigh the contents of NLT 20 Capsules, and calculate the average weight of the contents of each Capsule. Mix the combined contents of the Capsules, and transfer a portion, equivalent to 100 mg of acetaminophen, to a 200-mL volumetric flask. Add 100 mL of *Mobile phase*, shake by mechanical means for 10 min, and dilute with *Mobile phase* to volume. Transfer 5.0 mL of this solution to a 250-mL volumetric flask, and dilute with *Mobile phase* to volume. 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.
**Sample solution:** Nominally 0.01 mg/mL of acetaminophen from the *Sample stock solution* in *Mobile phase*. 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
**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 Capsules taken:

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

$r_U$ = 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)
**Acceptance criteria:** 90.0%–110.0%

## PERFORMANCE TESTS

• **DISSOLUTION** ⟨711⟩
**Medium:** Water; 900 mL
**Apparatus 2:** 50 rpm
**Time:** 45 min
**Standard solution:** A known concentration of USP Acetaminophen RS in *Medium*
**Sample solution:** A filtered portion of the solution under test, suitably diluted with *Medium* to obtain a concentration similar to that of the *Standard solution*