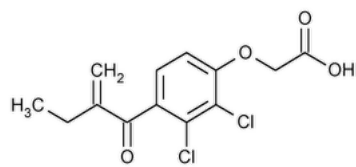


Status: Currently Official on 14-Feb-2025  
Official Date: Official as of 01-Dec-2021  
Document Type: USP Monographs  
DocId: GUID-D1D28F6E-C518-42A5-A085-5DEBB1B215D2\_5\_en-US  
DOI: [https://doi.org/10.31003/USPNF\\_M31090\\_05\\_01](https://doi.org/10.31003/USPNF_M31090_05_01)  
DOI Ref: z0lny

© 2025 USPC  
Do not distribute

# Ethacrynic Acid



$C_{13}H_{12}Cl_2O_4$  303.14  
Acetic acid, [2,3-dichloro-4-(2-methylene-1-oxobutyl)phenoxy]-;  
[2,3-Dichloro-4-(2-methylenebutyryl)phenoxy]acetic acid CAS RN®: 58-54-8; UNII: M5DP350VZV.

**DEFINITION**  
Ethacrynic Acid contains NLT 97.0% and NMT 102.0% of ethacrynic acid ( $C_{13}H_{12}Cl_2O_4$ ), calculated on the dried basis.  
[CAUTION—Use care in handling Ethacrynic Acid, because it irritates the skin, eyes, and mucous membranes.]

**IDENTIFICATION**

Change to read:

• **A. SPECTROSCOPIC IDENTIFICATION TESTS (197), Infrared Spectroscopy:** 197M ▲ or 197A ▲ (USP 1-Dec-2021)

Delete the following:

▲ **B. SPECTROSCOPIC IDENTIFICATION TESTS (197), Ultraviolet-Visible Spectroscopy:** 197U

**Analytical wavelength:** 271 nm

**Sample solution:** 50 µg/mL in [methanol](#)

**Acceptance criteria:** Absorptivities, calculated on the dried basis, do not differ by more than 3.0%. ▲ (USP 1-Dec-2021)

Add the following:

▲ **B.** The retention time of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the Assay. ▲ (USP 1-Dec-2021)

Delete the following:

▲ **C. PROCEDURE**

**Sample solution:** 12.5 mg/mL in 1 N sodium hydroxide

**Analysis:** Heat 2 mL of *Sample solution* for several min in a boiling water bath. Cool the solution, acidify with 0.25 mL of 18 N sulfuric acid, add 0.5 mL of chromatropic acid sodium salt solution (1 in 10), then add, cautiously, 2 mL of [sulfuric acid TS](#).

**Acceptance criteria:** A deep violet color is produced. ▲ (USP 1-Dec-2021)

**ASSAY**

Change to read:

• **PROCEDURE**

▲ **Solution A:** [Triethylamine](#) and [water](#) (1:100). Adjust with [phosphoric acid](#) to a pH of 6.8.

**Solution B:** [Acetonitrile](#)

**Mobile phase:** See [Table 1](#).

Table 1

| Time (min) | Solution A (%) | Solution B (%) |
|------------|----------------|----------------|
| 0          | 75             | 25             |
| 15         | 75             | 25             |
| 18         | 45             |                |

| Time<br>(min) | Solution A<br>(%) | Solution B<br>(%) |
|---------------|-------------------|-------------------|
| 20            | 75                | 25                |

**Diluent:** [Acetonitrile](#) and [water](#) (25:75)

**Standard solution:** 0.1 mg/mL of [USP Ethacrynic Acid RS](#) in *Diluent*. Sonicate to dissolve.

**Sample solution:** 0.1 mg/mL of Ethacrynic Acid in *Diluent*. Sonicate to dissolve.

#### Chromatographic system

(See [Chromatography \(621\), System Suitability](#).)

**Mode:** LC

**Detector:** UV 280 nm

**Column:** 4.0-mm × 25-cm; 5-μm packing [L1](#)

**Column temperature:** 30°

**Flow rate:** 1.8 mL/min

**Injection volume:** 50 μL

#### System suitability

**Sample:** *Standard solution*

#### Suitability requirements

**Tailing factor:** NMT 2.5

**Relative standard deviation:** NMT 0.73%

#### Analysis

**Samples:** *Standard solution* and *Sample solution*

Calculate the percentage of ethacrynic acid ( $C_{13}H_{12}Cl_2O_4$ ) in the portion of Ethacrynic Acid taken:

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

$r_U$  = peak response of ethacrynic acid from the *Sample solution*

$r_S$  = peak response of ethacrynic acid from the *Standard solution*

$C_S$  = concentration of [USP Ethacrynic Acid RS](#) in the *Standard solution* (mg/mL)

$C_U$  = concentration of Ethacrynic Acid in the *Sample solution* (mg/mL) ▲ (USP 1-Dec-2021)

**Acceptance criteria:** 97.0%–102.0% on the dried basis

#### IMPURITIES

• [RESIDUE ON IGNITION \(281\)](#): NMT 0.1%

Add the following:

#### ▲ • ORGANIC IMPURITIES

**Solution A, Solution B, Diluent, and Chromatographic system:** Proceed as directed in the Assay.

**Mobile phase:** See [Table 2](#).

**Table 2**

| Time<br>(min) | Solution A<br>(%) | Solution B<br>(%) |
|---------------|-------------------|-------------------|
| 0             | 75                | 25                |
| 20            | 75                | 25                |
| 45            | 45                | 55                |
| 50            | 45                | 55                |
| 51            | 75                | 25                |
| 60            | 75                | 25                |

**System suitability solution:** 1 mg/mL of [USP Ethacrynic Acid RS](#) and 1.5 μg/mL of [USP Ethacrynic Acid Related Compound A RS](#) in *Diluent*.

Sonicate to dissolve.

**Sensitivity solution:** 0.3 μg/mL of [USP Ethacrynic Acid RS](#) in *Diluent*