



Edition: BP 2025 (Ph. Eur. 11.6 update)

Undecenoic Acid



[General Notices](#)

(Undecylenic Acid, Ph. Eur. monograph 0461)



C₁₁H₂₀O₂ 184.3 112-38-9

Ph Eur

DEFINITION

Undec-10-enoic acid.

Content

97.0 per cent to 102.0 per cent.

CHARACTERS

Appearance

White or very pale yellow, crystalline mass or colourless or pale yellow liquid.

Solubility

Practically insoluble in water, freely soluble in ethanol (96 per cent) and in fatty and essential oils.

IDENTIFICATION

- Refractive index ([2.2.6](#)): 1.447 to 1.450, determined at 25 ± 0.5 °C.
- Freezing point ([2.2.18](#)): 21 °C to 24 °C.
- To 2.0 g add 2 mL of freshly distilled [aniline R](#) and boil under a reflux condenser for 10 min. Allow to cool and add 30 mL of [ether R](#). Shake with 3 quantities, each of 20 mL, of [dilute hydrochloric acid R](#) and then with 20 mL of [water R](#). Evaporate the organic layer to dryness on a water-bath. After recrystallising twice from [ethanol \(70 per cent V/V\) R](#) and drying *in vacuo* for 3 h, the residue melts ([2.2.14](#)) at 66 °C to 68 °C.
- Dissolve 0.1 g in a mixture of 2 mL of [dilute sulfuric acid R](#) and 5 mL of [glacial acetic acid R](#). Add dropwise 0.25 mL of [potassium permanganate solution R](#). The colour of the potassium permanganate is discharged.

TESTS

Peroxide value ([2.5.5, Method A](#))

Maximum 10.

Fixed and mineral oils

To 1.0 g add 5 mL of [sodium carbonate solution R](#) and 25 mL of [water R](#) and boil for 3 min. The hot solution is not more opalescent than reference suspension II ([2.2.1](#)).

Water-soluble acids

To 1.0 g add 20 mL of [water R](#) heated to 35-45 °C and shake for 2 min. Cool and filter the aqueous layer through a moistened filter. To 10 mL of the filtrate add 0.1 mL of [phenolphthalein solution R](#). Not more than 0.1 mL of [0.1 M sodium hydroxide](#) is required to change the colour of the indicator.

Degree of unsaturation

Dissolve 85.0 mg in a mixture of 5 mL of [dilute hydrochloric acid R](#) and 30 mL of [glacial acetic acid R](#). Using 0.05 mL of [indigo carmine solution R1](#) as indicator, added towards the end of the titration, titrate with [0.0167 M bromide-bromate](#) until the colour changes from blue to yellow. 8.9 mL to 9.4 mL of [0.0167 M bromide-bromate](#) is required. Carry out a blank titration.

Sulfated ash ([2.4.14](#))

Maximum 0.1 per cent, determined on 0.50 g.

ASSAY

Dissolve 0.750 g in 10 mL of [ethanol \(96 per cent\) R](#). Titrate with [0.5 M sodium hydroxide](#) using 0.1 mL of [phenolphthalein solution R](#) as indicator, until a pink colour is obtained.

1 mL of [0.5 M sodium hydroxide](#) is equivalent to 92.14 mg of $C_{11}H_{20}O_2$.

STORAGE

In a non-metallic container, protected from light.

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