



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

Activated Charcoal



[General Notices](#)

Decolourising Charcoal

(Ph. Eur. monograph 0313)

Action and use

Adsorbent.

Ph Eur

DEFINITION

Obtained from vegetable matter by suitable carbonisation processes intended to confer a high adsorption power.

CHARACTERS

Appearance

Black, light powder free from grittiness.

Solubility

Practically insoluble in all usual solvents.

IDENTIFICATION

- A. When heated to redness it burns slowly without a flame.
- B. Adsorption power (see Tests).

TESTS

Solution S

To 2.0 g in a conical flask with a ground-glass neck add 50 mL of [dilute hydrochloric acid R](#). Boil gently under a reflux condenser for 1 h, filter and wash the filter with [dilute hydrochloric acid R](#). Evaporate the combined filtrate and washings to dryness on a water-bath, dissolve the residue in [0.1 M hydrochloric acid](#) and dilute to 50.0 mL with the same acid.

Acidity or alkalinity

To 2.0 g add 40 mL of [water R](#) and boil for 5 min. Cool, restore to the original mass with [carbon dioxide-free water R](#) and filter. Reject the first 20 mL of the filtrate. To 10 mL of the filtrate add 0.25 mL of [bromothymol blue solution R1](#) and 0.25 mL of [0.02 M sodium hydroxide](#). The solution is blue. Not more than 0.75 mL of [0.02 M hydrochloric acid](#) is required to change the colour of the indicator to yellow.

Acid-soluble substances

Maximum 3 per cent.

To 1.0 g add 25 mL of [dilute nitric acid R](#) and boil for 5 min. Filter whilst hot through a sintered-glass filter (10) ([2.1.2](#)) and wash with 10 mL of hot [water R](#). Evaporate the combined filtrate and washings to dryness on a water-bath, add to the residue 1 mL of [hydrochloric acid R](#), evaporate to dryness again and dry the residue to constant mass at 100-105 °C. The residue weighs a maximum of 30 mg.

Alkali-soluble coloured substances

To 0.25 g add 10 mL of [dilute sodium hydroxide solution R](#) and boil for 1 min. Cool, filter and dilute the filtrate to 10 mL with [water R](#). The solution is not more intensely coloured than reference solution GY₄ ([2.2.2, Method II](#)).

Ethanol (96 per cent) soluble substances

Maximum 0.5 per cent.

To 2.0 g add 50 mL of [ethanol \(96 per cent\) R](#) and boil under a reflux condenser for 10 min. Filter immediately, cool, and dilute to 50 mL with [ethanol \(96 per cent\) R](#). The filtrate is not more intensely coloured than reference solution Y₆ or BY₆ ([2.2.2, Method II](#)). Evaporate 40 mL of the filtrate to dryness and dry to constant mass at 100-105 °C. The residue weighs a maximum of 8 mg.

Fluorescent substances

In an intermittent-extraction apparatus, treat 10.0 g with 100 mL of [cyclohexane R1](#) for 2 h. Collect the liquid and dilute to 100 mL with [cyclohexane R1](#). Examine in ultraviolet light at 365 nm. The fluorescence of the solution is not more intense than that of a solution of 83 µg of [quinine R](#) in 1000 mL of [0.005 M sulfuric acid](#) examined under the same conditions.

Sulfides

To 1.0 g in a conical flask add 5 mL of [hydrochloric acid R1](#) and 20 mL of [water R](#). Heat to boiling. The fumes released do not turn [lead acetate paper R](#) brown.

Copper

Maximum 25 ppm.

Atomic absorption spectrometry ([2.2.23, Method I](#)).

Test solution Use solution S.

Reference solutions Prepare the reference solutions using [copper standard solution \(0.1 per cent Cu\) R](#) and diluting with [0.1 M hydrochloric acid](#).

Source Copper hollow-cathode lamp.

Wavelength 325.0 nm.

Atomisation device Air-acetylene flame.

Lead

Maximum 10 ppm.

Atomic absorption spectrometry ([2.2.23, Method I](#)).

Test solution Use solution S.

Reference solutions Prepare the reference solutions using [lead standard solution \(100 ppm Pb\) R](#) and diluting with [0.1 M hydrochloric acid](#).

Source Lead hollow-cathode lamp.

Wavelength 283.3 nm; 217.0 nm may be used depending on the apparatus.

Atomisation device Air-acetylene flame.

Zinc

Maximum 25 ppm.

Atomic absorption spectrometry ([2.2.23, Method I](#)).

Test solution Use solution S.

Reference solutions Prepare the reference solutions using [zinc standard solution \(100 ppm Zn\) R](#) and diluting with [0.1 M hydrochloric acid](#).

Source Zinc hollow-cathode lamp.

Wavelength 214.0 nm.

Atomisation device Air-acetylene flame.

Loss on drying (2.2.32)

Maximum 15 per cent, determined on 1.00 g by drying in an oven at 120 °C for 4 h.

Sulfated ash (2.4.14)

Maximum 5.0 per cent, determined on 1.0 g.

Adsorption power

To 0.300 g in a 100 mL ground-glass-stoppered conical flask add 25.0 mL of a freshly prepared solution of 0.5 g of [phenazone R](#) in 50 mL of [water R](#). Shake thoroughly for 15 min. Filter and reject the first 5 mL of filtrate. To 10.0 mL of the filtrate add 1.0 g of [potassium bromide R](#) and 20 mL of [dilute hydrochloric acid R](#). Using 0.1 mL of [methyl red solution R](#) as indicator, titrate with [0.0167 M potassium bromate](#) until the red colour is discharged. Titrate slowly (1 drop every 15 s) towards the end of the titration. Carry out a blank titration using 10.0 mL of the phenazone solution.

Calculate the quantity of phenazone adsorbed per 100 g of activated charcoal from the following expression:

$$\frac{2.353(a-b)}{m}$$

a = number of millilitres of [0.0167 M potassium bromate](#) used for the blank;

b = number of millilitres of [0.0167 M potassium bromate](#) used for the test;

m = mass in grams of the substance to be examined.

Minimum 40 g of phenazone is adsorbed per 100 g of activated charcoal, calculated with reference to the dried substance.

Microbial contamination

TAMC: acceptance criterion 10³ CFU/g ([2.6.12](#)).

TYMC: acceptance criterion 10² CFU/g ([2.6.12](#)).

STORAGE

In an airtight container.

