

RHUBARB FOR HOMOEOPATHIC PREPARATIONS

RHEUM FOR HOMOEOPATHIC PREPARATIONS

Rheum officinale et Rheum palmatum ad praeparationes homoeopathicas

The herbal drug complies with the requirements of monograph *Rhubarb* (0291).

STOCK

DEFINITION

Rhubarb mother tincture complies with the requirements of the general technique for the preparation of mother tinctures (see *Homoeopathic Preparations* (1038) and French Pharmacopoeia Authority Supplement). The mother tincture is prepared with ethanol (65 per cent V/V), using the dried underground parts of *Rheum officinale* Baillon or *Rheum palmatum* L.

Adjusted content: minimum 0.10 per cent *m/m* and maximum 0.20 per cent *m/m* of hydroxyanthracene derivatives, expressed as rhein (C₁₅H₈O₆ ; M_r 284.2).

CHARACTERS

Appearance: dark brown liquid, colouring the walls of the flask yellow.

IDENTIFICATION

Thin-layer chromatography (2.2.27).

Test solution. Mother tincture.

Reference solution (a). Dissolve 10 mg of *aloe-emodin R* and 5 mg of *chrysophanic acid R* in 20 mL of *ethanol* (65 per cent V/V) R.

Reference solution (b). Dissolve 10 mg of *emodin R* and 5 mg of *physcion R* in 20 mL of *ethanol* (65 per cent V/V) R.

Plate : TLC silica gel plate R.

Mobile phase : *anhydrous formic acid R*, *ethyl acetate R*, *light petroleum R* (1:25:75 V/V/V) (*this mixture should be prepared immediately before use*).

Application : 20 mL, as bands.

Development : over a path of 10 cm.

Drying : in air.

Detection A : examine in ultraviolet light at 365 nm.

The General Chapters and General Monographs of the European Pharmacopoeia and Preamble of the French Pharmacopoeia apply.

Results A : see below the sequence of fluorescent zones present in the chromatograms of the reference test and the test solution. Furthermore other fluorescent zones may be present in the chromatogram obtained with the test solution.

Top of the plate	
Chrysophanic acid : an orange zone	An orange zone (chrysophanic acid)
Physcion : an orange zone	An orange zone (physcion)
Emodin : an orange-brown zone	An orange-brown zone (emodin)
Aloe-emodin : an orange zone	An orange zone (aloe-emodin)
Reference solution	Test solution

Detection B : spray the plate with a 100 g/L solution of *potassium hydroxide R* in *methanol R*. Examine in daylight.

Results B : see below the sequence of zones present in the chromatograms of the reference solution and the test solution. Furthermore other zones may be present in the chromatogram obtained with the test solution.

Top of the plate	
Chrysophanic acid: a purplish-pink zone	A purplish-pink zone (chrysophanic acid)
Physcion : a purplish-pink zone	A purplish-pink zone (physcion)
Emodin : a purplish-pink zone	A purplish-pink zone (emodin)
Aloe-emodin : a purplish-pink zone	A purplish-pink zone (aloe-emodin)
Reference solution	Test solution

TESTS

Ethanol (2.9.10): 60 per cent V/V to 70 per cent V/V.

Dry residue (2.8.16): minimum 2.0 per cent m/m.

Rheum rhaponticum mother tincture. Examine the rhubarb mother tincture in ultraviolet light at 365 nm. Orange-brown fluorescence is observed. The presence of blue fluorescence may indicate adulteration with Rheum rhaponticum mother tincture.

ASSAY

Visible absorption spectrophotometry (2.2.25).

Test solution. In a 100 mL round-bottomed flask, weigh 1.000 g of mother tincture. Add 30.0 mL of *water R*, mix and weigh. Place the round-bottomed flask in a water-bath and heat in a reflux condenser for 15 min. Allow to cool. Add 50 mg of *sodium bicarbonate R*. Weigh and adjust to the original mass with *water R*. Introduce 10.0 mL of this solution in a 100 mL round-bottomed flask with a ground-glass neck. Add 20 mL of *ferric chloride solution R1*. Mix. Heat in a water-bath in a reflux condenser for 20 min. Add 1 mL of *hydrochloric acid R* and continue heating for 20 min, stirring frequently. Allow to cool. Transfer the mixture into a separating funnel and shake with three quantities, each of 25 mL of *ether R* previously used to rinse the

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flask. Combine the ether phases and wash with two quantities, each of 15 mL of *water R*. Filter the ether phases through a plug of absorbent cotton into a round-bottomed flask with a ground-glass neck, taking care to rinse the filter with small amounts of *ether R*. Evaporate to dryness on a waterbath under reduced pressure. Dissolve the residue in 50.0 mL of *methanol R*, then evaporate 5.0 mL of this solution to dryness on a water bath. Dissolve the residue in 10.0 mL of a 5 g/L solution of *magnesium acetate R* in *methanol R*.

Compensation liquid : methanol R.

Measure the absorbance of the solution at 515 nm in comparison with the compensation liquid.

Calculate the percentage content *m/m* of hydroxyanthracene derivatives expressed as rhein, from the expression :

$$\frac{A \times 0.64}{m}$$

i.e. taking the specific absorbance of rhein to be 468 at 515 nm.

A = absorbance of the test solution at 515 nm,

m = mass of the mother tincture sample, in grams.