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

Urea Cream

General Notices

DEFINITION

Urea Cream contains Urea in a suitable basis.

The cream complies with the requirements stated under Topical Semi-solid Preparations and with the following requirements.

Content of urea, CH_4N_2O

90.0 to 110.0% of the stated amount.

IDENTIFICATION

A. Carry out the method for *thin-layer chromatography*, Appendix III A, using a silica gel precoated plate (Merck silica gel 60 plates are suitable). Apply separately to the plate 10 µL of each of the following solutions. For solution (1) disperse with heating a quantity of the cream containing 50 mg of Urea in 1 mL of *water*, cool, add 4 mL of *acetone*, mix and filter. For solution (2) dissolve 50 mg of *urea* in 1 mL of *water* and add 4 mL of *acetone*. Solution (3) is a mixture of equal volumes of solutions (1) and (2). For the first development use *2,2,4-trimethylpentane* as the mobile phase. Remove the plate and allow it to dry in air. For the second development use as the mobile phase a mixture of 99 volumes of *absolute ethanol* and 1 volume of 13.5M *ammonia*. After removal of the plate, allow it to dry in air and spray with a solution containing 0.5% w/v of *4-dimethylaminobenzaldehyde* and 0.5% v/v of *sulfuric acid* in *absolute ethanol*. The principal spot in the chromatogram obtained with solution (1) corresponds to that in the chromatogram obtained with solution (2). The test is not valid unless the chromatogram obtained with solution (3) shows a single, compact principal spot.
B. To a quantity containing 0.1 g of Urea add 50 mL of *water* and heat until dispersed, cool in ice and filter through glass wool. Adjust the pH of the filtrate, which may not be clear, to between 6.0 and 7.0 using 0.1M *hydrochloric acid* or 0.1M *sodium hydroxide* as necessary. To 5 mL add 5 mL of a 0.1% w/v suspension of *urease-active meal* and allow to stand for 30 minutes in a stoppered flask at 37°. When the resulting solution is heated in a water bath, a vapour is produced that turns moist *red litmus paper* blue.

TESTS

Ammonia

Not more than 2.0% with respect to the content of urea, CH_4N_2O (determined in the Assay) when determined by the following method. Prepare a 0.035% w/v solution of *ammonium sulfate* in 1M *sulfuric acid* (solution A). Carry out the method for *ion-selective potentiometry*, Appendix VIII E, using an ammonia-selective electrode. Determine the response slope of the electrode using standard ammonia solutions and measure the emf in the following solutions. For solution (1) shake a quantity of the cream (w_1 g) containing 40 mg of Urea with 5 mL of 1M *sulfuric acid* to disperse, warming if necessary, add 10 mL of *2,2,4-trimethylpentane*, shake for 2 minutes and centrifuge. Dilute 3 mL of the aqueous layer to 50 mL with *water* and to 20 mL of the resulting solution add 4 mL of 1M *sodium hydroxide*. Prepare solution (2) in the same

manner but shaking a quantity of the cream (w_2 g) containing 40 mg of Urea with 5 mL of solution A in place of 5 mL of 1M *sulfuric acid*.

Calculate C_1 and hence the concentration of ammonia in the cream from the expression:

$\Delta E = a \log(w_2/w_1 + C_2/C_1)$

where	ΔE	=	the difference in the emf, in mV, obtained with the two solutions,
	a	=	the response slope in mV per decade,
	C_1	=	the concentration of ammonia in solution (1) as % w/v,
	C_2	=	the concentration of standard added ammonia in solution (2) as % w/v (this is 0.0129 times the concentration of ammonium sulfate in solution A as % w/v), namely 0.000451% w/v.

ASSAY

Shake a quantity containing 42 mg of Urea with 150 mL of hot *water* for 20 minutes, allow to cool and dilute to 500 mL with *water*. Filter through a fine glass microfibre filter paper (Whatman GF/C is suitable), transfer 1 mL of the filtrate to a 100 mL graduated flask, add 2 mL of a 0.1% w/v suspension of *urease-active meal*, stopper the flask and allow to stand for 15 minutes at 37°. Immediately add 25 mL of a solution containing 12 g of *sodium salicylate* and 0.24 g of *sodium nitroprusside* in 200 mL and 25 mL of a solution prepared by diluting a volume of *sodium hypochlorite solution* containing the equivalent of 0.66 g of available chlorine with 0.2M *sodium hydroxide* to 1000 mL. Mix well, allow to stand at 37° for 5 minutes and dilute to 100 mL with *water*. Measure the *absorbance* of the resulting solution at the maximum at 665 nm, Appendix II B, using in the reference cell a solution prepared in the same manner but using 1 mL of *water* in place of 1 mL of the filtrate. Repeat the operation using 42 mg of *urea BPCRS* in place of the cream being examined. Calculate the content of CH_4N_2O from the *absorbances* obtained using the declared content of CH_4N_2O in *urea BPCRS*.

STORAGE

Urea Cream should be stored in accordance with the manufacturer's instructions.