

Enquiry

Introduction of the degree of hydration in monograph titles

Since 2000, the European Pharmacopoeia Commission's policy is to indicate the degree of hydration in the title of each new monograph. National authorities have requested that, for consistency purposes, the degree of hydration is now explicitly indicated in all titles of relevant Ph. Eur. monographs due to their use in marketing authorisation documents. Furthermore, it is considered to be a good opportunity to harmonise as far as possible the titles and definitions in the Ph. Eur. Consequently, it is proposed that monographs elaborated before 2000 are revised for the 8th Edition of the Ph. Eur. (implemented on 1 January 2014) in order to achieve consistency between titles, chemical formulae and definitions for most European monographs, based on the following principles:

- introduction of the degree of hydration in titles in connection with chemical formulae and definitions for substances with a well-defined degree of hydration;
- when 'xH₂O' is stated in the chemical formula and no anhydrous form is covered by the same monograph, introduction of 'hydrated' in the title and 'It contains a variable quantity of water' in the definition, where applicable.

The table below shows the proposed modifications highlighted in grey.

Users are requested to send their comments and information concerning the hydrated/anhydrous forms that are currently found on the European market via the online survey (www.edqm.eu/hydration-enquiry) by 31 March 2012.

Group of experts	Title	Proposed modification to the title, add:	Monograph number	Molecular formula (number of H ₂ O)	Definition	Limit for Water Content %	Limit for Loss on Drying %
PIII	Almagate [INN for 4H ₂ O]	hydrated	2010	4H ₂ O to be replaced by xH ₂ O	hydrated	-	-
INC	Aluminium phosphate, hydrated	-	1598	x	'variable quantity of water' to be added	-	-
INC	Aluminium sulfate	hydrated	0165	x	variable quantity of water	-	-
10B	Amiloride hydrochloride	dihydrate	0651	2	dihydrate	11.0-13.0	
11	Apomorphine hydrochloride	hemihydrate	0136	1/2	hemihydrate		2.5-4.2
11	Atropine sulfate	monohydrate	0068	1	monohydrate	2.0-4.0	
7	Azithromycin	hydrated	1649	x=1 or 2	degree of hydration 1 or 2	1.8-6.5	
7	Benzylpenicillin, benzathine	tetrahydrate	0373	4H ₂ O to be added	'variable quantity of water' to be replaced by tetrahydrate	5.0-8.0	
7	Benzylpenicillin, procaine	monohydrate	0115	1	monohydrate	2.8-4.2	
10A	Bupivacaine hydrochloride	monohydrate	0541	1	monohydrate		4.5-6.0

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10A	Caffeine	anhydrous [monograph Caffeine monohydrate (0268) also in Ph. Eur.]	0267	-	-		
VIT	Calcifediol	monohydrate	1295	1	monohydrate	3.8-5.0	
VIT	Calcium ascorbate	dihydrate	1182	2	dihydrate		max 0.1
11	Calcium folinate	hydrated	0978	x	variable quantity of water	max 17.0	
INC	Calcium gluconate	monohydrate	0172	1	monohydrate	-	-
INC	Calcium gluconate for injection	monohydrate	0979	1	monohydrate	-	-
10A	Carbidopa	monohydrate	0755	1	monohydrate		6.9-7.9
7	Cefaclor	monohydrate	0986	1	monohydrate	3.0-6.5	
7	Cefixime	trihydrate	1188	3	trihydrate	9.0-12.0	
7	Ceftriaxone sodium	3.5-hydrate	0991	3 1/2	3.5-hydrate	8.0-11.0	
10B	Cetylpyridinium chloride	monohydrate	0379	1	monohydrate to be added	4.5-5.5	
11	Chloroquine sulfate	monohydrate	0545	1	monohydrate to be added	3.0-5.0	
10C	Cilazapril	monohydrate	1499	1	monohydrate	3.5-5.0	
10B	Ciprofloxacin hydrochloride	hydrated	0888	x	variable quantity of water	max 6.7	
7	Clindamycin hydrochloride	monohydrate	0582	H₂O to be added	'variable quantity of water' to be replaced by monohydrate	3.0-6.0	
7	Cloxacillin sodium	monohydrate	0661	1	monohydrate	3.0-4.5	
11	Codeine	monohydrate	0076	1	monohydrate		4.0-6.0
11	Cyclophosphamide	monohydrate	0711	1	monohydrate to be added	6.0-7.0	
10A	Cyproheptadine hydrochloride	sesquihydrate	0817	1 1/2	sesquihydrate	7.0-9.0	
11	Dextromethorphan hydrobromide	monohydrate	0020	1	monohydrate	4.0-5.5	
7	Dicloxacillin sodium	monohydrate	0663	1	monohydrate	3.0-4.5	
10B	Dihydralazine sulfate, hydrated	hydrated to be replaced by 2.5-hydrate	1310	2 1/2	2.5-hydrate		13.0-15.0
10D	Disodium edetate	dihydrate	0232	2	dihydrate	-	-
11	Doxapram hydrochloride	monohydrate	1201	1	monohydrate to be added		3.0-4.5
11	Ethylmorphine hydrochloride	dihydrate	0491	2	dihydrate	8.0-10.0	
INC	Ferrous gluconate	hydrated	0493	x	variable quantity of water		5.0-10.5

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7	Flucloxacillin sodium	monohydrate	0668	1	monohydrate	3.0-4.5	
7	Fosfomycin calcium	monohydrate	1328	1	monohydrate	8.5-11.5	
7	Fusidic acid	hemihydrate	0798	1/2	hemihydrate	1.4-2.0	
11	Histamine phosphate	monohydrate	0144	1	monohydrate to be added	5.0-6.2	
11	Hyoscine hydrobromide	trihydrate	0106	3	trihydrate	10.0-13.0	
11	Hyoscyamine sulfate	dihydrate	0501	2	dihydrate	2.0-5.5	
7	Imipenem	monohydrate	1226	1	monohydrate	5.0-8.0	
11	Ipratropium bromide	monohydrate	0919	1	monohydrate	3.9-4.4	
10A	Isoprenaline sulfate	dihydrate	0502	2	dihydrate	5.0-7.5	
7	Kanamycin monosulfate	monohydrate	0032	1	monohydrate to be added		max 1.5
11	Levothyroxine sodium	hydrated	0401	x ≈ 5	variable quantity of water	6.0-12.0	
10A	Lidocaine hydrochloride	monohydrate	0227	1	monohydrate	5.5-7.0	
7	Lincomycin hydrochloride	monohydrate	0583	1	monohydrate	3.1-4.6	
INC	Lithium citrate	tetrahydrate	0621	4	tetrahydrate	24.0-27.0	
INC	Magnesium carbonate, heavy	hydrated	0043	-	hydrated	-	-
INC	Magnesium carbonate, light	hydrated	0042	-	hydrated	-	-
INC	Magnesium trisilicate	hydrated	0403	x	-	-	-
10B	Mercaptopurine	monohydrate	0096	1	monohydrate to be added	10.0-12.0	
10A	Methyldopa	sesquihydrate	0045	1 1/2	sesquihydrate to be added	10.0-13.0	
10A	Methylthioninium chloride	hydrated	1132	x	'variable quantity of water' to be added		8.0-22.0
10C	Metixene hydrochloride	monohydrate	1347	1	monohydrate to be added	4.0-6.0	
10A	Metoclopramide hydrochloride	monohydrate	0674	1	monohydrate to be added	4.5-5.5	
11	Morphine hydrochloride	trihydrate	0097	3	trihydrate	12.5-15.5	
11	Morphine sulfate	pentahydrate	1244	5	pentahydrate	10.4-13.4	
7	Mupirocin calcium	dihydrate	1451	2	dihydrate	3.0-4.5	
10A	Noradrenaline tartrate	monohydrate	0285	1	monohydrate	4.5-5.8	
11	Noscapine hydrochloride	monohydrate	0515	1	monohydrate		2.5-6.5

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10C	Omeprazole magnesium	tetrahydrate	2374	4H ₂ O to be added	'variable quantity of water' to be replaced by tetrahydrate	7.0-10.0	
10C	Omeprazole sodium	monohydrate	1032	1	monohydrate	4.5-10.0	
11	Ouabain	octahydrate	0048	8	octahydrate to be added	18.0-22.0	
PRP	Pentetate sodium calcium for radiopharmaceutical preparations	hydrated	2353	x	'variable quantity of water' to be added	max 15.0	
11	Pholcodine	monohydrate	0522	1	monohydrate		3.9-4.5
7	Piperacillin	monohydrate	1169	1	monohydrate	2.0-4.0	
10B	Piperazine citrate	hydrated	0424	x	variable quantity of water	10.0-14.0	
10B	Piperazine hydrate	hydrate to be replaced by hexahydrate	0425	6	hexahydrate	-	-
INC	Potassium citrate	monohydrate	0400	1	monohydrate	4.0-7.0	
11	Quinidine sulfate	dihydrate	0017	2	-		3.0-5.0
11	Quinine hydrochloride	dihydrate	0018	2	-		6.0-10.0
11	Quinine sulfate	dihydrate	0019	2	-		3.0-5.0
VIT	Riboflavin sodium phosphate	hydrated	0786	xH ₂ O to be added	variable quantity of water		max 8.0 %
11	Sodium alendronate	trihydrate	1564	3	trihydrate to be added		16.1-17.1
10D	Sodium calcium edetate	hydrated	0231	x	variable quantity of water	5.0-13.0	
INC	Sodium citrate	dihydrate	0412	2	dihydrate	11.0-13.0	
INC	Sodium nitroprusside	dihydrate	0565	2	dihydrate	9.0-15.0	
10D	Sodium picosulfate	monohydrate	1031	1	monohydrate	3.0-5.0	
INC	Sodium thiosulfate	pentahydrate	0414	5	pentahydrate to be added	-	-
7	Succinylsulfathiazole	monohydrate	0357	1	monohydrate		4.0-5.5
7	Sulfacetamide sodium	monohydrate	0107	1	monohydrate to be added	6.0-8.0	
10A	Suxamethonium chloride	dihydrate	0248	2	dihydrate to be added	8.0-10.0	
10A	Theophylline-ethylenediamine hydrate	hydrate to be replaced by hydrated	0301	x	'variable quantity of water' to be added	3.0-8.0	
10B	Tosylchloramide sodium	trihydrate	0381	3	trihydrate	-	-
11	Tubocurarine chloride	pentahydrate	0305	5	pentahydrate to be added	9.0-12.0	