

Preface to the third edition

For many years, the second edition of "Pharmazeutische Wirkstoffe" has been out of print and colleagues and friends have asked and plagued us to publish a new edition. Everyone who has ever prepared a similar reference book knows how much energy and enthusiasm has to be put into such a task besides the "daily job" in industry. After some hesitation we finally decided to prepare the new edition, in English. Two fortunate circumstances made things a lot easier.

Firstly, Mr. Willi Plein brought us into contact with Dr. H.-G. Scharnow of the FIZ CHEMIE BERLIN¹⁾, who was interested in preparing the new edition as an electronic version by making use of their specialised know-how and self-developed software. With this technology we were able to transform greater parts of the second edition, especially the formula drawings, into the new electronic version – thereby establishing an innovative method of book production, making future new editions much easier to prepare, and also enabling the publisher to offer a CD-ROM version. The FIZ CHEMIE team was successful in attracting the BMBF²⁾ for this interesting project and luckily received generous financial support.

Secondly, we persuaded the young colleagues Prof. Dr. Bernhard Kutscher and Dr. Dietmar Reichert to take responsibility as "junior authors" for this book. About a quarter of the workload for this volume was done by them and furthermore they have the capability and talent to contribute to future editions – if hopefully necessary.

The purpose and object of this book are to establish a link between INN's³⁾, structure, synthesis and production processes, patent (and literature) situation, medical use and trade names of important pharmaceuticals.

This volume contains a collection of 2171 active pharmaceutical ingredients, which are listed alphabetically according to their INN's. Often there are still other Generic Names in use, for example BAN⁴⁾, DCF⁵⁾, USAN⁶⁾, which are added in brackets under the INN's and are listed in the index. In addition to the foregoing editions, we have added the molecular formulas and molecular weights as well as the CAS Registry Numbers⁷⁾ and where available the ATC Code Numbers⁸⁾, the EINECS numbers⁹⁾, and data for

acute toxicology as well as pharmaceutical dosage forms. In the last section of each monograph, the trade names in the six most important markets are listed. The trade names were taken from the relevant reference books on pharmaceutical specialities^{10) 11) 12)}.

Within the 16 years since the second edition, respectively 11 years since the supplement volumes were published, many changes have occurred. Companies disappeared or were acquired and the trade names of many products were changed. Some products were withdrawn from the market, either as mono drugs or combinations. In such cases, we added "w f m" behind the trade name, when we felt that we should not eliminate

¹⁾ FIZ CHEMIE BERLIN, Fachinformationszentrum Chemie GmbH, Franklinstraße 11, D-10587 Berlin

²⁾ Bundesministerium für Bildung, Wissenschaft, Forschung und Technologie, Bonn

³⁾ INN = International Nonproprietary Names; synonymous with "Generic Names"

⁴⁾ BAN = British Approved Name

⁵⁾ DCF = Dénomination Commune Française

⁶⁾ USAN = United States Adopted Name

⁷⁾ CAS = Chemical Abstracts Service

⁸⁾ ATC = Anatomic Therapeutic Chemical (Classification of Drugs)

a) ATC Index, WHO Collaborating Center for Drug Statistics Methodology, Oslo 1997

b) European Drug Index, N. F. Miller, R. P. Dessing, 4th ed., Deutscher Apotheker Verlag Stuttgart 1997

⁹⁾ EINECS = European Inventory of Existing Chemical Substances

¹⁰⁾ "WDI, World Drug Index" – database, Derwent Information, 1998

¹¹⁾ "MDDR"-database, Drug Data Report, Prous Science, MDL, San Leandro, 1998

¹²⁾ Speciality lists for

D: "Rote Liste 2000", Hrsg. Bundesverband der Pharmazeutischen Industrie e.V., Frankfurt/M.

"List of Pharmaceutical Substances", 10. edition, ABDATA Pharma-Daten-Service, Eschbom, March 1997

F: "Dictionnaire VIDAL 1998" OUP, Paris

GB: "MIMS" (Monthly Index of Medical Specialities), Haymarket Publishing Services Ltd., London 1998

I: "L'Informatore Farmaceutico", 58. edit., Organizzazione Editoriale Medico Farmaceutico srl, Milano 1998

J: a) "Japta List" 1987, Japanese Drug Directory, 3rd ed., Tokyo 1987

b) Drugs in Japan/Ethical Drugs 1970, 10, ed. by Japan Pharmaceutical Information Center, Tokyo, Japan

USA: "PDR, Physicians Desk Reference", 52. edition, 1998; Medical Economics Comp., Montvale, N. J.

the monograph or its former trade name because the drug is still in use in other countries or in numerous combinations – even if not listed here – or is of historical interest. The given trade names are normally representing the mono drug product. In some cases, we listed the year of market introduction behind the name of the company.

It was the intention of the authors to present the synthesis routes in broad details. In many cases, we describe different synthesis routes, especially for the economically most important drugs – but also when we are not completely sure which particular route is applied technically. The practicability of such a reference book is to a great extent dependent on clearly arranged and in-depth indexes. The reader will find appropriate and comprehensive indexes for

1. Trade Names
2. Intermediates
3. Enzymes, Microorganisms, Plants, Animal Tissues
4. Substance classes.

As many abbreviations are used in this book, a separate “list of abbreviations” has been added, see front and back endpapers. Concerning abbreviations for chemicals and reagents we adhered to the “Standard List of Abbreviations”, published in *J. Org. Chem.*, Vol. **68**, No. 1, 1998, p. 19A.

We have had many discussions regarding the inclusion of the newer biopharmaceuticals (“Pharmaproteins”) which are produced by recombinant DNA methods (e.g., Interferons, human Insulin, Erythropoietin etc.). After several trials, we dropped this plan because we could not find a

concept consistent with the original character of the book, which predominantly contains synthetic drugs as well as some antibiotics made by conventional fermentation and some plant ingredients that are produced by extraction. A borderline case exists with many synthetic peptides. It is often practically impossible to find out the applied technical synthesis process among the manifold routes described in the literature. So, we more or less stayed with the peptide drugs that were already included in the 2nd edition and supplement volume.

The book is designed to serve the needs of not only the specialists in drug synthesis but also of a broad usergroup in the chemical, intermediates and pharmaceutical industry, pharmacists, universities and other research institutes. So, it is important for everybody who has to deal with pharmaceuticals or their raw materials and intermediates and would like to have a quick survey. For the analytical chemist, knowledge about the synthesis route of an active ingredient is essential in order to recognize contaminations with intermediates or possible byproducts. Often, also the allergologist has a need for information regarding the synthesis of a drug in order to localize allergic byproducts or intermediates. The synthetic chemist will be provided with stimulating suggestions for his work.

We hope that this book will prove to be a standard reference for everyone who is interested in pharmaceuticals.

Frankfurt a. M., Autumn 1998 Axel Kleemann
Jürgen Engel

Acknowledgements

Preparing a reference book of this kind is by no means feasible without the contributions of numerous dedicated colleagues who bring in their special expertise and knowledge.

The authors are deeply indebted to Dr. Hans-Georg Scharnow, Ingo Adamczyk, Gerhard Fabian, Martin Holberg, Gudrun Lippmann, Ulrich Quandt, Karin Raatsch and Dr. Katrin Seemeyer from FIZ CHEMIE BERLIN, for providing their computer know-how and software expertise. This FIZ CHEMIE team has taken a decisive part in the preparation of the book, also in reminding the authors regularly of their obligation to deliver the manuscripts on time. It was always a reliable, fruitful and pleasant cooperation. We also wish to extend our gratefulness to the BMBF (Bundesministerium für Bildung, Wissenschaft, Forschung und Technologie) for generous support of this project.

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Important advice concerning the pharmaceutical specialities on the Japanese market was provided by our Japanese colleague Nobuo Kumagai, whom we wish to thank sincerely.

A word of thanks has also to be addressed to Dr. Elisabeth Hillen and Dr. Rolf Hoppe from the Georg Thieme Verlag for the always good cooperation and acceptance of many special suggestions concerning the production of this book and its CD-ROM version.

Finally, we would like to express our gratitude to the many readers and users of the foregoing editions who took the time to provide us with comments, corrections and suggestions.

The authors

Introduction

This reference book describes the production/isolation processes of 2267 active pharmaceutical substances (including the syntheses of their intermediates) that are or have been marketed. In order to illustrate what particular information can be drawn from the book a typical monograph is depicted below and labelled. It is self-explanatory.

The frequently-used abbreviations are explained in a separate list, q.v. see front and back endpapers.

With respect to the names of reagents and intermediates in the course of the syntheses the authors tried to use the names found in the catalogues of the commercial providers of fine chemicals, e.g. Sigma-Aldrich, otherwise the Chemical Abstracts Names are given.

In addition to the respective patents and publications in journals several standard reference books for Pharmaceuticals and Fine Chemicals were used and sometimes also cited. The most important sources are given here:

- The Merck Index, 12 ed., Merck & Co., Inc.; NJ 1996
abbrev.: Merck Index
- Z. Budesinsky and M. Protiva, *Synthetische Arzneimittel*, Akademie-Verlag, Berlin 1961
abbrev.: Budesinsky-Protiva
- G. Ehrhart, H. Ruschig, *Arzneimittel*, vols. 1–5, Verlag Chemie, Weinheim 1972
abbrev.: Ehrhart-Ruschig

- Index Nominum, international drug directory, ed. by Swiss Pharmaceutical Society, 1992/93
- A. Kleemann, E. Lindner, J. Engel, *Arzneimittel-Fortschritte 1972–1985*, VCH Verlagsgesellschaft mbH, Weinheim 1987
- D. Lednicer, L. A. Mitscher, *The Organic Chemistry of Drug Synthesis*, vols. 1–6, John Wiley & Sons, New York 1977–1999
- Ullmanns Encyclopädie der technischen Chemie, 3. and 4. edition, Verlag Chemie Weinheim;
- Ullmann's Encyclopedia of Industrial Chemistry, 5. ed., vols. A1–A28, B1–B8, VCH Verlagsgesellschaft mbH, Weinheim 1985–1997
abbrev.: Ullmanns Encycl. Techn. Chem.
- Ullmann's Encyclopedia of Industrial Chemistry, 6. ed., on CD-ROM, 1999 and 2000
M. Negwer, *Organic-chemical drugs and their synonyms*, Akademie-Verlag, Berlin 1994
USP Dictionary of USAN and International Drug Names, US Pharmacopeia, Rockville, MD 1998

The acute toxicity data were in most cases taken from different data banks or other secondary sources, so no guarantee can be given for validity.

For information regarding pharmaceutical dosage forms see preface, footnote 12.

Alphabetical List of Drug Monographs

- A**
 547 1160
 149097 (as free base) 1114
 151235 (as hydrochloride) 1114
 A 50 316
 A 4166 1406
 A-64077 2198
 A-73001 1864
 A-84538 1823
 AA-673 99
 AA-2414 1864
 Abacavir 1
 ABC-12/3 715
 Abciximab 4
 ABT-001 1864
 ABT-077 2198
 ABI-538 1823
 ABI-569 2026
 AC 4464 2081
 Acamprosate calcium 5
 Acamylphenin 328
 Acarbose 5
 ACC 9653 940
 Acebutolol 6
 Acecarbromal 7
 Aceclidine 8
 Aceclofenac 8
 Acediasulfone 9
 Acediasulfone sodium 9
 Acefylline 10
 Acefylline heptaminol 10
 Aceglutamide aluminum 11
 Acemetacin 11
 Acenocoumarol 13
 Acenocoumarin 13
 Acepifylline 10
 Aceprominum 1507
 Acepromazine 14
 Aceprometazine 14
 Acetaminophenol 1557
 Acetarsol 15
 Acetarsone 15
 Acetazolamide 16
 Acetazolesamide 16
 Acetcarbromal 7
 Acetylhydrocodone 2007
 Acetiamine 17
 Acetohexamide 17
 Acetomenadione 1239
 Acetomenaftone 1239
 Acetophenazine 18
 Acetophenetidin 1606
 Acetorphan 19
 Acetphenolisatin 1538
 Acetrisoate sodium 20
 Acetrisoic acid 20
 Acetsalicylamide 1848
 Acetylcarbromal 7
 Acetylcholine chloride 20
 Acetylcysteine 22
 Acetyldigoxin 23
 α -Acetyldigoxin 24
 β -Acetyldigoxin 26
 Acetylhomocysteine thiolactone 490
N-Acetyl-4-hydroxy-L-proline 1507
 Acetylsalicylic acid 28
 Acetylsulfafurazole 29
 Acetylsulfisoxazole 29
 Acexamic acid 30
 Aciclovir 31
 Acide acexamique 30
 Acide aminocaproïque 91
 Acide ascorbique 137
 Acide aspartique 140
 Acide bucloxiqne 280
 Acide chenodéoxycholique 421
 Acide cicrotioïque 465
 Acide déhydrocholique 582
 Acide edétique 729
 Acide étacrynique 788
 Acide flufenamique 880
 Acide gentisique 959
 Acide iobenzamique 1079
 Acide iocétamique 1080
 Acide ioglycémique 1083
 Acide iotalamique 1088
 Acide ioxaglique 1091
 Acide ioxitalamique 1092
 Acide métiazinique 1306
 Acide nicotinique 1432
 Acide orotique 1502
 Acide oxolinique 1525
 Acide pipemidique 1647
 Acide protizinique 1745
 Acide tranexamique 2088
 Acido bendazolico 191
 Acidum acetylsalicylicum 28
 Acidum azolinicum 480
 Acidum cromoglicicum 550
 Acidum edeticum 729
 Acidum iopanoicum 1086
 Acidum iophenoicum 1087
 Acidum nicotinicum 1432
 Acidum salicylicum 1852
 Acipimox 33
 Aclacinomycin A 34
 Aclarubicin 34
 Aclatonium napadisilate 35
 ACNU 1447
 Acriflavine hydrochloride 36
 Acriflavinium chloride 36
 Acrinol 792
 Acrivastine 37
 Acrosoxacin 1841
 Actarit 39
 Actinomyacin D 571
 Actinoquinol 39
 Actinospectacin 1890
 Acycloguanosine 31
 Acyclovir 31
 AD-6 530
 AD-810 2209
 AD-4833 1642
 ADD-03055 831
 Ademetionine 40
 Adenosylcobalamin 538
 Adenosylmethionine 40
 Adiphenine 41
 Adipiodone 42
 Adrafinil 43
 Adrenaline 752
 Adrenalone 43
 Adriamycin 716
 4'-*epi*-Adriamycin 754
 Aescin 776
 Aethacridin 792
 Äthacrynsäure 788
 Aethiazidum 797
 Äthinylostradiol 798
 Aethotoin 802
 Äthylestrenol 804
 Äthylisobutrazin 821
 Äthylloestrenol 804
 Äthynodioldiacetat 822
 AF-2139 574
 Afloqualone 44
 AG-629 1897
 AG-1343 1414
 AG-EE-388 1795
 AG-EE-6237W 1795
 AGN-190168 1973
 AGN-190342LF (tartrate) 259
 AHIR-10282 268
 AICA-Orotate 1491
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 AL-4862 260
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 Alatrofloxacin mesilate 47
 Albuterol 1849
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 Alclometasone dipropionate 49
 Aleloxa 63
 Alcoholium benzylicum 214
 Alcuronium chloride 51
 Aldesulfon Natrium 1941
 Aldioxa 63
 Aldosterone 52
 Alendronate sodium 53
 Alfalcidol 54
 Alfadolone acetate 55
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 Alfasonne acetophenide 60
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 Alfentanil 58
 Alfuzosin 59
 Algestone acetophenide 60
 Alibendol 61
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 Alizapride 63
 Allantoin 63
 Allobarbitol 65
 Allobarbitone 65
 Allopurinol 65
 Allylbarbituric acid 299
 Allylestrenol 67
 Allyloestrenol 67
 Alminoprofen 67
 Almitrine 68
 Aloxiptin 69
 Alphachymotrypsin 458
 Alphadolone acetate 55
 Alphaprodine 69
 Alphasone acetophenide 60
 Alphaxalone 56
 Alpidem 70
 Alprazolam 71
 Aprenolol 72
 Althiazide 73
 Altizide 73
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 Aluminium clofibrate 75
 Aluminium nicotinate 75
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 Ambenonium chloride 78
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 Ambuside 80
 Amcinonide 81
 Ametazole 236
 Amethocaine 2000
 Amethopterin 1287
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 Buniodyl 287
 Bunitrolol 289
 Buphenine 290
 Bupheniodes 291
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 Buprenorphine 293
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 Buserelin 294
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 Butalbital 299
 Butamirate 299
 Butanilcaine 300
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 BX-661-A 175
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- C**
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 Calcium carbaspirin 340
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 Camazepam 326
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Zinc pyrithione 1758
Zipeprol 2201
Ziprasidone hydrochloride
2202
ZK-36374 1048
ZM 204636 1766
ZN-1694 1783
Zolimidine 2204
Zolmitriptan 2204
Zolpidem 2207
Zomepirac 2208
Zonisamide 2209
Zopiclone 2210
Zorubicin 2211
Zotepine 2211
Zymofren 133

Molecular formula

ATC Code Number

INN

CAS Registry Number

Medical Use, Therapeutic category

other Generic Names (Synonyms)

Simvastatin
(MK-733; Synvinolin)

ATC: C10AA01
Use: antihyperlipidemic cholesterol synthesis inhibitor, HMG-CoA-reductase inhibitor

Acute Toxicity

RN: 79902-63-9 MF: C₂₅H₃₈O₅ MW: 418.57 EINECS: n/a
LD₅₀: 3 g/kg (M, p.o.); 4438 mg/kg (R, p.o.); >5 g/kg (dog, p.o.)

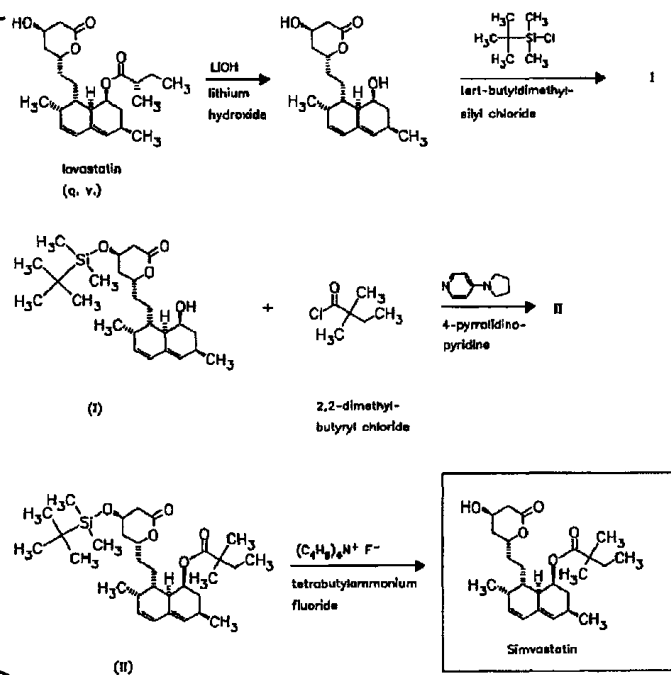
EINECS Number (where given if available)

Chemical Abstracts name

CN: [1S-[1 α ,3 α ,7 β ,8 β -(2S*,4S*),8 α]]-2,2-dimethylbutanoic acid 1,2,3,7,8,8a-hexahydro-3,7-dimethyl-8-[2-(tetrahydro-4-hydroxy-6-oxo-2H-pyran-2-yl)ethyl]-1-naphthalenyl ester

Molecular weight

Synthesis Scheme



Structure of Title INN

Issue date for US patent

Literature and Patent references

Reference(s):
 US 4 444 784 (Merck & Co.; 24.4.1984; prior. 5.8.1980, 4.2.1980).
 US 4 450 171 (Merck & Co.; 22.5.1984; prior. 14.6.1982, 18.12.1980, 5.8.1980, 4.2.1980).
 Hoffmann, W.F. et al.: J. Med. Chem. (JMCMAR) 29, 849 (1986).

alternative synthesis:
 US 5 159 104 (Merck & Co.; 27.10.1992; appl. 1.5.1992).
 GB 2 255 974 (Merck & Co.; 25.11.1992; US-prior. 24.5.1991).
 WO 9 812 188 (Brantford; 5.9.1997; CA-prior. 19.9.1996).
 US 5 763 653 (Ranbaxy; 9.6.1998; appl. 13.3.1997).
 US 5 763 646 (Ranbaxy; 9.6.1998; appl. 13.3.1997).
 US 5 393 893 (Apotex; 28.2.1995; appl. 8.11.1993).
 EP 33 538 (Merck & Co.; appl. 2.2.1981; USA-prior. 4.2.1980, 5.8.1980).

Application and Priority dates

Pharmaceutical dosage forms

controlled-release formulation:
 EP 302 693 (Merck & Co.; appl. 1.8.1988; USA-prior. 3.8.1987, 31.8.1987).

Formulation(s): f.c. tabl. 5 mg, 10 mg, 20 mg, 40 mg; tabl. 5 mg, 10 mg, 20 mg, 40 mg

Trade Names in important markets

Trade Name(s):

D:	Denan (Boehringer Ing.; 1990)	GB:	Zocor (Merck Sharp & Dohme)	Sivastin (Sigma-Tau)
F:	Zocor (Dieckmann; 1990)	I:	Liponorm (Gentli)	Zocor (Neopharmed)
	Lodales (Sanofi Winthrop)		Medipo (Mediolanum)	J: Lipovas (Banyu)
	Zocor (MSD-Chibret; 1989)		Sinvacor (Merck Sharp & Dohme)	USA: Zocor (Merck)

Marketing Company

Year of introduction

Abacavir
(1592U89)

ATC: J05AF06
Use: antiviral, anti HIV, reverse transcriptase inhibitor

RN: 136470-78-5 MF: C₁₄H₁₈N₆O MW: 286.34
CN: (1*S*,4*R*)-4-[2-Amino-6-(cyclopropylamino)-9*H*-purin-9-yl]-2-cyclopentene-1-methanol

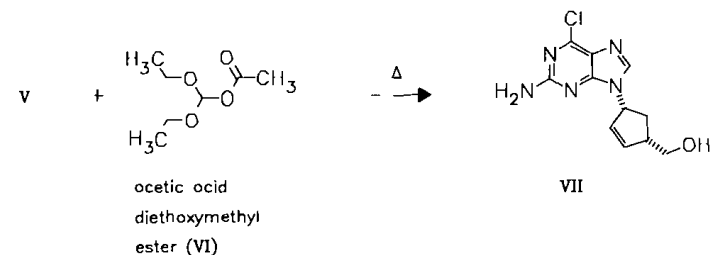
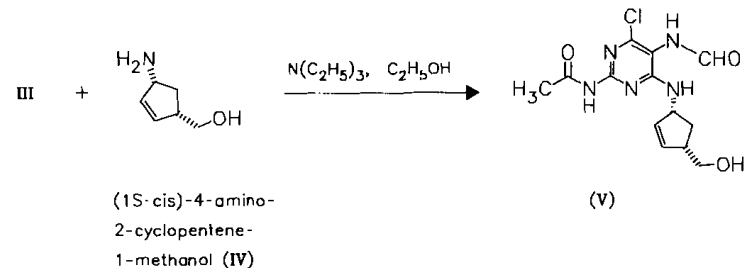
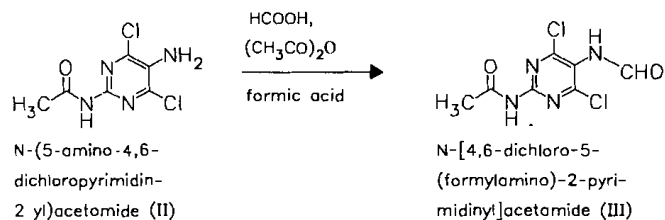
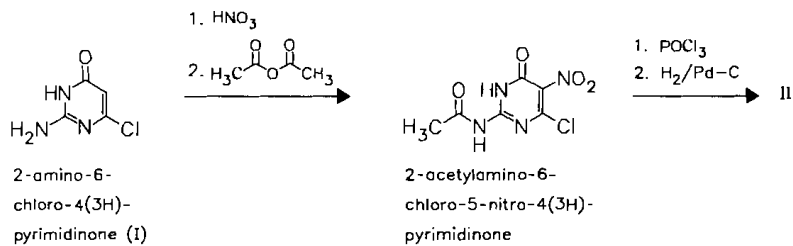
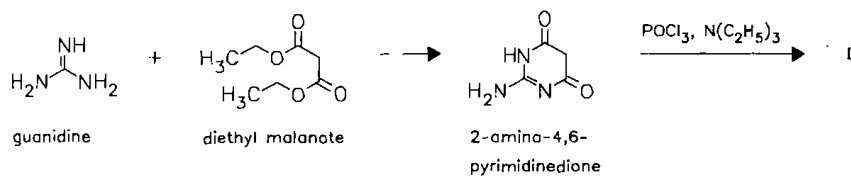
succinate

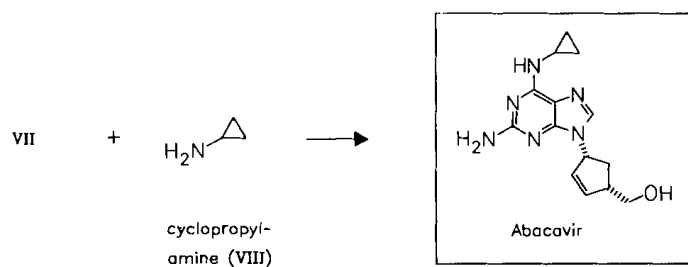
RN: 168146-84-7 MF: C₁₄H₁₈N₆O · C₄H₆O MW: 356.43

sulfate

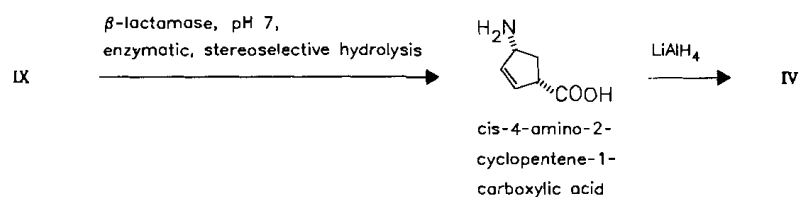
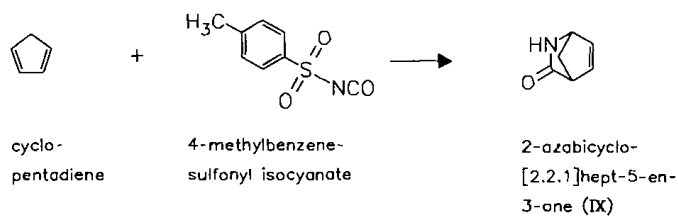
RN: 188062-50-2 MF: C₁₄H₁₈N₆O · 1/2H₂SO₄ MW: 670.76

ⓐ

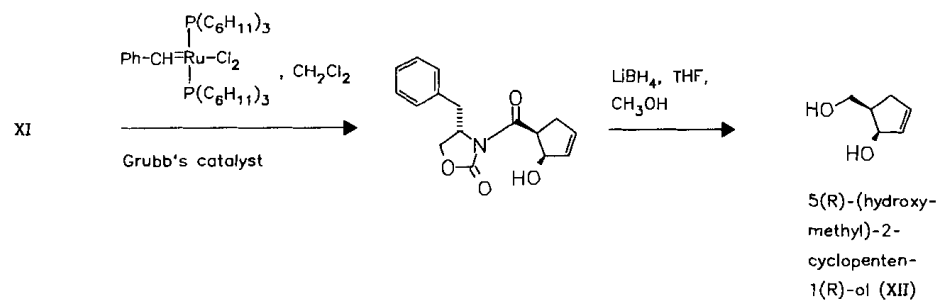
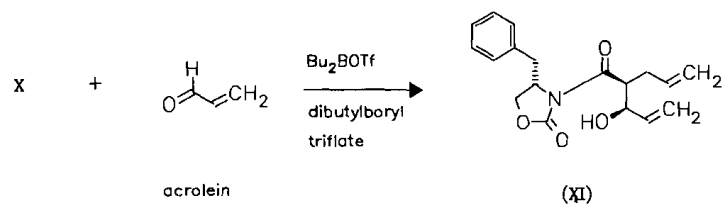
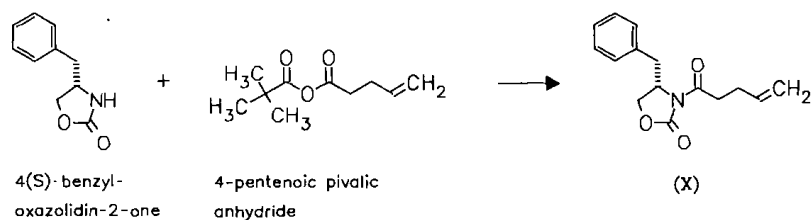


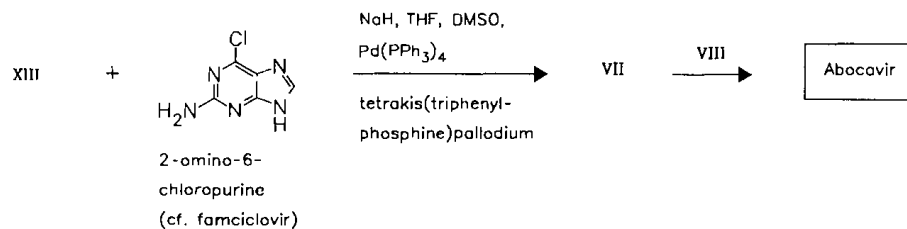
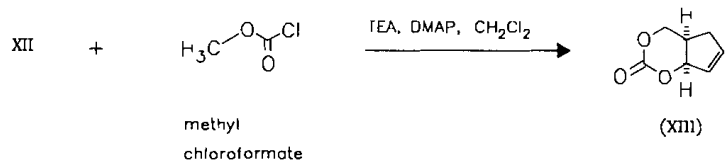


(aa) synthesis of (1S-cis)-4-amino-2-cyclopentene-1-methanol (IV)

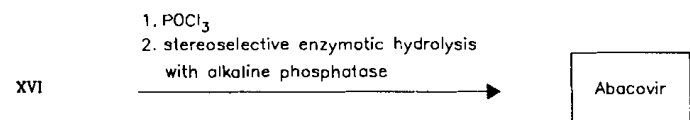
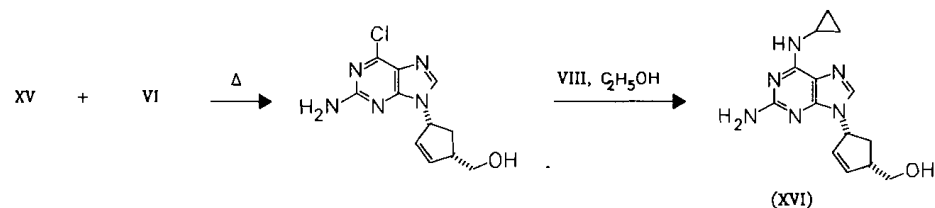
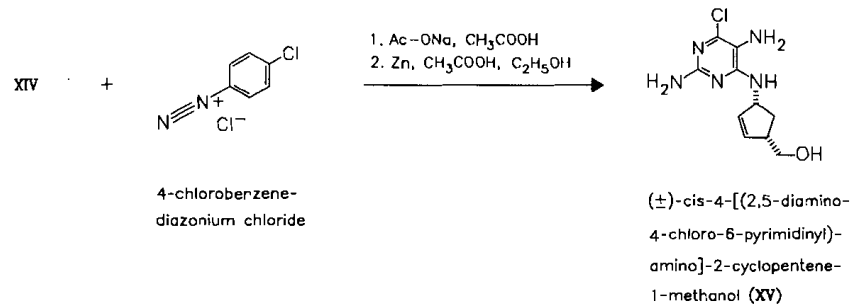
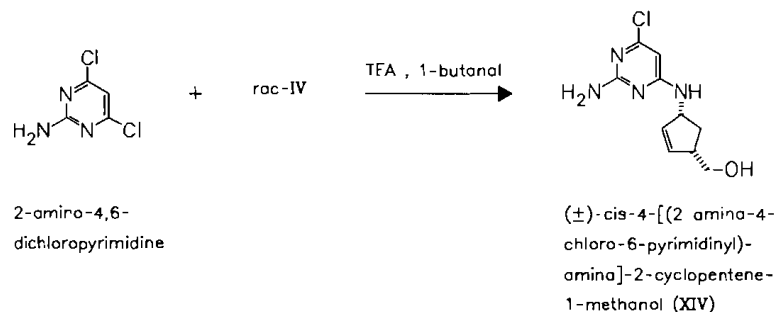


(b)

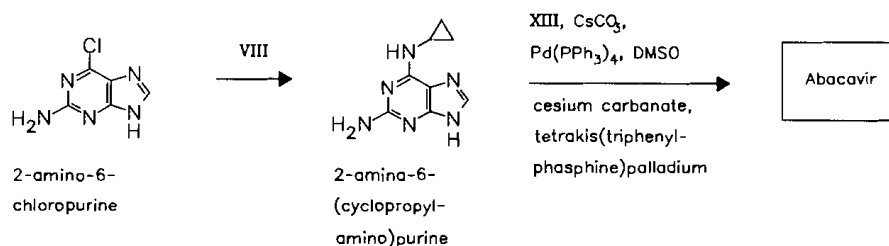




(c)



d

*Reference(s):*

- a EP 434 450 (Wellcome Found.; 26.6.1991; appl. 21.12.1990; USA-prior. 22.12.1989).
Crimmins, M.T. et al.: J. Org. Chem. (JOCEAH) **61** 4192 (1996).
- aa EP 424 064 (Enzymatix; appl. 24.4.1991; GB-prior. 16.10.1989).
- b Olivo, H.F. et al.: J. Chem. Soc., Perkin Trans. 1 (JCPRB4) **1998**, 391.
- c US 5 034 394 (Wellcome Found.; 23.7.1991; appl. 22.12.1989; GB-prior. 27.6.1988).
- d WO 9 924 431 (Glaxo; appl. 12.11.1998; WO-prior. 12.11.1997).

alternative syntheses:

EP 878 548 (Lonza; appl. 13.5.1998; CH-prior. 13.5.1997).

condensation of pyrimidines with cyclopentylamine IV:

Vince, R.; Hua, M.: J. Med. Chem. (JMCMAR) **33** (1), 17 (1990).
EP 349 242 (Wellcome Found.; appl. 26.6.1989; GB-prior. 27.6.1988).
EP 366 385 (Wellcome Found.; appl. 23.10.1989; GB-prior. 24.10.1988).
Grumam, A. et al.: Tetrahedron Lett. (TELEAY) **36** (42), 7767 (1995).
JP 1 022 853 (Asahi Glass Co.; appl. 17.7.1987).

alternative preparation of 4-amino-2-cyclopentene-1-methanol:

EP 926 131 (Lonza; appl. 24.11.1998; CH-prior. 27.11.1997).
WO 9 745 529 (Lonza; appl. 30.5.1997; CH-prior. 30.5.1996).

abacavir succinate as antiviral agent:

WO 9 606 844 (Wellcome; 7.3.1996; appl. 25.8.1995; GB-prior. 26.8.1994).

synergistic combinations for treatment of HIV infection:

WO 9 630 025 (Wellcome; 3.10.1996; appl. 28.3.1996; GB-prior. 30.3.1995).

Formulation(s): oral sol. 20 mg/ml; tabl. 300 mg (as sulfate)

Trade Name(s):

D: Ziagen (Glaxo Wellcome; 1999) USA: Ziagen (Glaxo Wellcome)

Abciximab

(7E3; C7E3; C7E3 Fab; C7E3-F(ab')₂)

ATC: B01AC13

Use: platelet antiaggregation inhibitor, antianginal, GPIIb/IIIa-receptor antagonist

RN: 143653-53-6 MF: unspecified MW: unspecified

CN: immunoglobulin G (human-mouse monoclonal c7E3 clone p7E3V_HhCγ₄ Fab fragment antihuman glycoprotein IIb/IIIa receptor), disulfide with human-mouse monoclonal c7E3 clone p7E3V_KhCκ light chain

Reference(s):

Gold, H.K. et al.: Circulation Suppl. (CISUAQ) **80**(4) (1989), Abst. 1063.

Formulation(s): vial 10 mg/5 ml

Trade Name(s):

D: ReoPro (Lilly) GB: Reopro (Lilly)
F: ReoPro (Lilly) USA: ReoPro (Lilly)

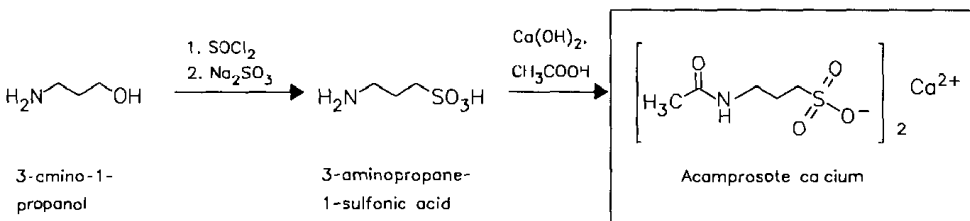
Acamprosate calcium

ATC: V03AA
Use: alcohol deterrent

RN: 77337-73-6 MF: $C_{10}H_{20}CaN_2O_8S_2$ MW: 400.49 EINECS: 278-665-3
LD₅₀: >10 g/kg (M, p.o.)
CN: 3-(acetylamino)-1-propanesulfonic acid calcium salt (2:1)

free acid

RN: 77337-76-9 MF: $C_5H_{11}NO_4S$ MW: 181.21 EINECS: 278-667-4



Reference(s):

DE 3 019 350 (Lab. Meram; appl. 21.5.1980; F-prior. 23.5.1979).

synthesis of 3-aminopropane-1-sulfonic acid:

JP 46 002 012 (Kowa; appl. 19.1.1971).

Fujii, A. et al.: J. Med. Chem. (JMCMAR) **18**, 502 (1975).

WO 8 400 958 (Mitsui; appl. 15.3.1984; J-prior. 7.9.1982, 19.7.1983, 8.9.1982).

Formulation(s): tabl. 333 mg

Trade Name(s):

D: Campral (Lipha) F: Aotal (Meram) GB: Campral (Lipha)

Acarbose

(Bay-g-5421)

ATC: A10BF01
Use: antidiabetic, α -glucosidase inhibitor, hypoglycemic

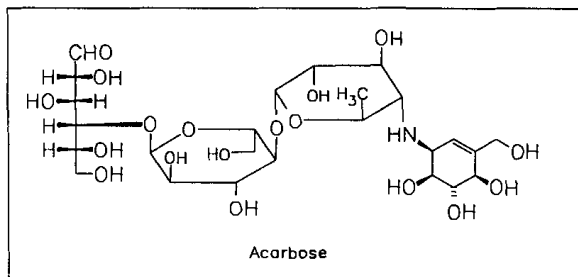
RN: 56180-94-0 MF: $C_{25}H_{43}NO_{18}$ MW: 645.61 EINECS: 260-030-7

LD₅₀: >500.000 SIE/kg (M, i.v.); >1000.000 SIE/kg (M, p.o.);

478.000 SIE/kg (R, i.v.); >1000.000 SIE/kg (R, p.o.)

65.000 SIE = 1g (SIE = saccharase inhibitory units)

CN: [1S-(1 α ,4 α ,5 β ,6 α)]-O-4,6-dideoxy-4-[[4,5,6-trihydroxy-3-(hydroxymethyl)-2-cyclohexen-1-yl]amino]- α -D-glucopyranosyl(1 \rightarrow 4)-O- α -D-glucopyranosyl-(1 \rightarrow 4)-D-glucose



Fermentation of *Actinoplanes* SE50/110.

Reference(s):

US 4 062 950 (Bayer; 13.12.1977; D-prior. 22.9.1973).
 DOS 2 347 782 (Bayer; appl. 21.9.1973).
 Schmidt, D.D. et al.: *Naturwissenschaften (NATWAY)* **64**, 535 (1977).

total synthesis:

Ogawa, S.; Shibata, Y.: *Chem. Commun. (CCOMA8)* **1988**, 605.

review:

Tschesche, H. in *Arzneimittel, Fortschritte 1972-1985* (Ed. A. Kleemann, E. Lindner, J. Engel), p. 87, VCH Verlagsgesellschaft, Weinheim 1987.

Formulation(s): tabl. 50 mg, 100 mg

Trade Name(s):

D:	Glucobay (Bayer; 1990)	GB:	Glucobay (Bayer)	USA:	Precose (Bayer)
F:	Glucor (Bayer)	J:	Glucobay (Bayer)		

Acebutolol

ATC: C07AB04; C07BB04
 Use: β -adrenergic receptor blocker

RN: 37517-30-9 MF: $C_{18}H_{28}N_2O_4$ MW: 336.43 EINECS: 253-539-0
 LD₅₀: 75.2 mg/kg (M, i.v.);
 4 mg/kg (dog, i.v.)
 CN: (\pm)-*N*-[3-acetyl-4-[2-hydroxy-3-[(1-methylethyl)amino]propoxy]phenyl]butanamide

(R)-base

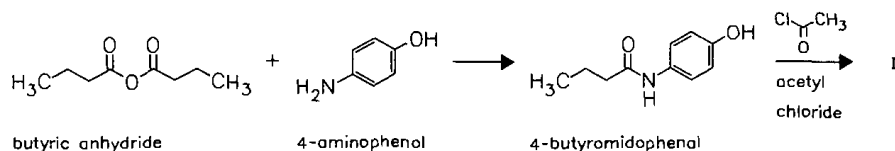
RN: 68107-81-3 MF: $C_{18}H_{28}N_2O_4$ MW: 336.43

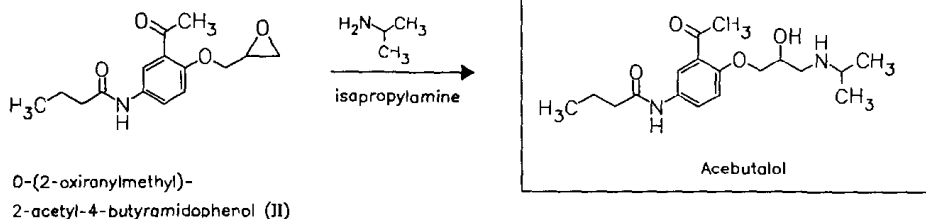
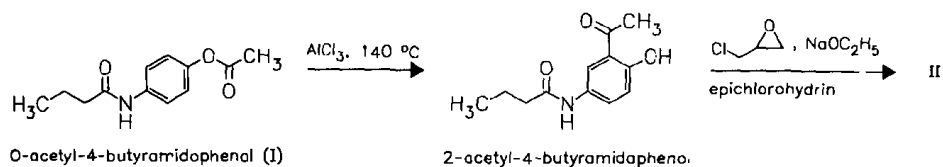
(S)-base

RN: 68107-82-4 MF: $C_{18}H_{28}N_2O_4$ MW: 336.43

(RS)-monohydrochloride

RN: 34381-68-5 MF: $C_{18}H_{28}N_2O_4 \cdot HCl$ MW: 372.89 EINECS: 251-980-3
 LD₅₀: 185 mg/kg (M, i.p.); 53 mg/kg (M, i.v.); 4050 mg/kg (M, p.o.); 291 mg/kg (M, s.c.);
 222 mg/kg (R, i.p.); 103 mg/kg (R, i.v.); 6620 mg/kg (R, p.o.); 1310 mg/kg (R, s.c.);
 41 mg/kg (rabbit, i.v.); 296 mg/kg (rabbit, p.o.)





Reference(s):

GB 1 247 384 (May & Baker; appl. 22.12.1967).
 DAS 1 815 808 (May & Baker; appl. 19.12.1968; GB-prior. 22.12.1967, 14.5.1968, 2.8.1968).
 US 3 726 919 (May & Baker; appl. 19.12.1968; GB-prior. 22.12.1967, 14.5.1968, 2.8.1968).
 US 3 857 952 (May & Baker; appl. 3.8.1972).

preparation of 4-butyramidophenol:

Kuhn; Koehler; Koehler: Hoppe-Seyler's Z. Physiol. Chem. (HSZPAZ) **247**, 197, 216 (1937).
 Verma, K.K.; Tyagi, P.: Anal. Chem. (ANCHAM) **56** (12), 2157 (1984).
 US 2 824 838 (Esso Research & Eng. Co.; 25.2.1958; appl. 13.1.1955).

Formulation(s): amp. 25 mg; tabl. 200 mg, 400 mg (as hydrochloride)

Trade Name(s):

D:	Prent (Bayer; 1977)	Sectral (Rhône-Poulenc Rorer; 1975)	J:	Acetanol (Rhodia; 1984)
	Sali-Prent (Bayer; 1982)-comb.	I:	Accecor (SPA)	USA: Sectral (Kanebo; 1981)
	Tredalat (Bayer)-comb.		Alol (SIT)	USA: Sectral (Wyeth-Ayerst; 1985)
F:	Sectral (Specia; 1976)		Prent (Bayropharm; 1981)	
GB:	Secadrex (Rhône-Poulenc Rorer; 1982)-comb.		Sectral (Rhône-Poulenc Rorer; 1980)	

Accecarbromal

(Acetylcarbromal; Acetcarbromal)

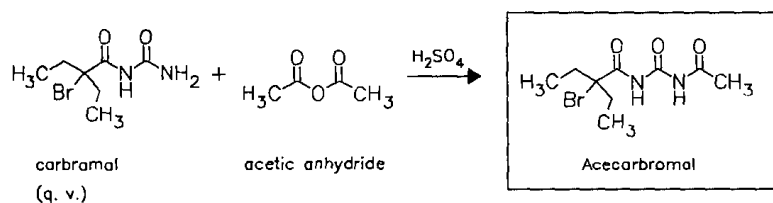
ATC: N05CM

Use: sedative, hypnotic

RN: 77-66-7 MF: C₉H₁₅BrN₂O₃ MW: 279.13 EINECS: 201-047-1

LD₅₀: 1600 mg/kg (M, p.o.)

CN: N-[(acetylamino)carbonyl]-2-bromo-2-ethylbutanamide



Reference(s):

DRP 225 710 (Bayer; 1910).

alternative syntheses:

DRP 286 760 (Bayer; 1913).

DRP 327 129 (Bayer; 1917).

Formulation(s): drg. 100 mg

Trade Name(s):

D: Abasin (Bayer); wfm USA: Carbased (Mallard); wfm
Afrodor (Farco-Pharma) Sedamyl (Riker); wfm

Aceclidine

ATC: S01EB08; S01EB58

Use: antiglaucoma, miotic

RN: 827-61-2 MF: C₉H₁₅NO₂ MW: 169.22 EINECS: 212-574-1

LD₅₀: 78 mg/kg (M, i.p.); 36 mg/kg (M, i.v.); 165 mg/kg (M, p.o.); 102 mg/kg (M, s.c.);
45 mg/kg (R, i.v.); 225 mg/kg (R, s.c.)

CN: 1-azabicyclo[2.2.2]octan-3-ol acetate (ester)

hydrochloride

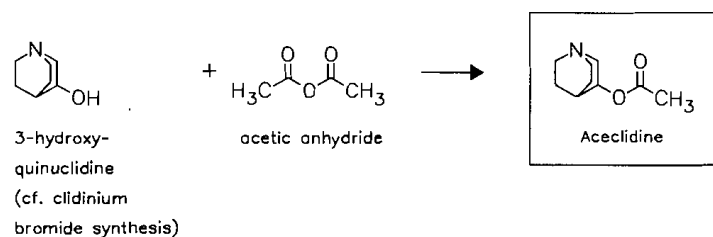
RN: 6109-70-2 MF: C₉H₁₅NO₂ · HCl MW: 205.69 EINECS: 228-071-5

LD₅₀: 27 mg/kg (M, i.v.); 165 mg/kg (M, p.o.);
45 mg/kg (R, i.v.)

salicylate (1:1)

RN: 6821-59-6 MF: C₉H₁₅NO₂ · C₇H₆O₃ MW: 307.35

LD₅₀: 113 mg/kg (M, s.c.)



Reference(s):

US 2 648 667 (Roche; 1953; prior. 1951).

Grob, C.A. et al.: Helv. Chim. Acta (HCACAV) **40**, 2170 (1957).

Formulation(s): eye drops 200 mg (as hydrochloride), 20 mg

Trade Name(s):

D: Glaucotat (Chibret) Glaucostat (Merck Sharp &
F: Glaucadrine (Merck Sharp Dohme-Chibret)
& Dohme-Chibret)-comb. I: Glaunorm (Farmigea)

Aceclofenac

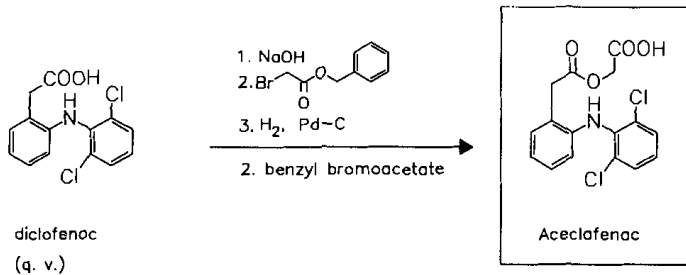
ATC: M01AB16

Use: non-steroidal anti-inflammatory,
analgesic, antipyretic, prostaglandin
synthesis inhibitor

RN: 89796-99-6 MF: C₁₆H₁₃Cl₂NO₄ MW: 354.19

LD₅₀: 121 mg/kg (M, p.o.)

CN: 2-[(2,6-dichlorophenyl)amino]benzenecetic acid carboxymethyl ester



Reference(s):

EP 119 932 (Prodes; appl. 19.3.1984; E-prior. 21.3.1983).
US 4 548 952 (Prodes; 22.10.1985; appl. 15.3.1984; E-prior. 21.3.1983).

alternative synthesis:

ES 2 020 146 (Prodesfarma; appl. 29.5.1990).

Formulation(s): cream 1.5 %; vial 150 mg; tabl. 100 mg

Trade Name(s):

GB: Preservex (Bristol-Myers
Squibb; 1992)

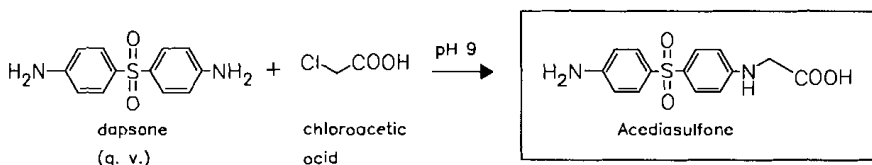
Acediasulfone

ATC: S02
Use: antibacterial, cytotoxic agent

RN: 80-03-5 MF: C₁₄H₁₄N₂O₄S MW: 306.34 EINECS: 201-243-7
CN: N-[4-[(4-aminophenyl)sulfonyl]phenyl]glycine

monosodium salt

RN: 127-60-6 MF: C₁₄H₁₃N₂NaO₄S MW: 328.32 EINECS: 204-852-6



Reference(s):

CH 254 803 (Cilag; appl. 1946).
CH 278 482 (Cilag; appl. 1949).
US 2 589 211 (Parke Davis; 1952; appl. 1948).
US 2 454 835 (Parke Davis; 1948; prior. 1943).
US 2 751 382 (Cilag; 1956; D-prior. 6.7.1953).

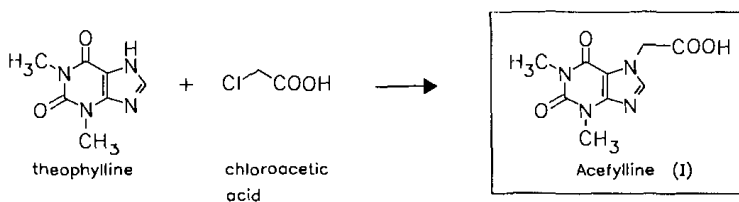
Trade Name(s):

D: Ciloprin (Cilag-Chemie)-
comb.; wfm

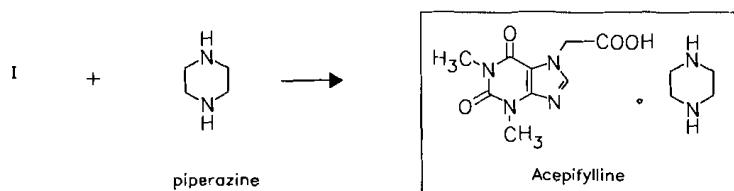
Acefylline

ATC: R03B
 Use: cardiotonic, diuretic, antispasmodic,
 bronchodilator

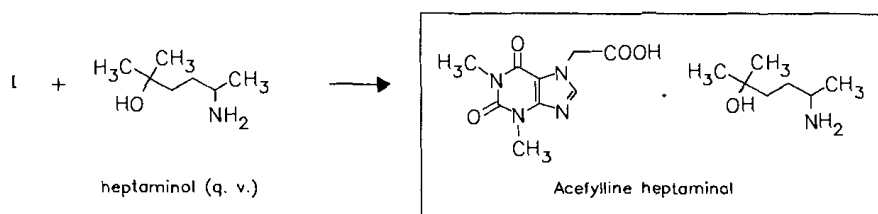
RN: 652-37-9 MF: $C_9H_{10}N_4O_4$ MW: 238.20 EINECS: 211-490-2
 LD₅₀: 1180 mg/kg (M, i.p.); 2733 mg/kg (M, p.o.)
 CN: 1,2,3,6-tetrahydro-1,3-dimethyl-2,6-dioxo-7H-purine-7-acetic acid

**Acepifylline**

RN: 18833-13-1 MF: $C_9H_{10}N_4O_4 \cdot xC_4H_{10}N_2$ MW: unspecified EINECS: 242-614-3
 CN: 1,2,3,6-tetrahydro-1,3-dimethyl-2,6-dioxo-7H-purine-7-acetic acid compd. with piperazine

**Acefylline heptaminol**

RN: 59989-20-7 MF: $C_9H_{10}N_4O_3 \cdot C_8H_{19}NO$ MW: 367.45 EINECS: 262-012-4
 CN: 1,2,3,6-tetrahydro-1,3-dimethyl-2,6-dioxo-7H-purine-7-acetic acid compd. with 6-amino-2-methyl-2-heptaminol (1:1)

**Reference(s):**

Blaisse, J.: Bull. Soc. Chim. Fr. (BSCFAS) **1949**, 769.

Formulation(s): amp. 500 mg/200 ml; drg. 250 mg; suppos. 500 mg; tabl. 250 mg (acepifylline); drg. 250 mg; inj. 0.5 g; suppos. 0.5-1 g

Trade Name(s):

D: Etaphydel (Delalande; as
 acepifylline); wfm

F: Sureptil (Synthelabo; as
 acefylline-heptaminol)-
 comb.

GB: Etophylate (Delalande; as
 acepifylline); wfm
 I: Sureptil (Delalande
 Isnardi)-comb.

Aceglutamide aluminum

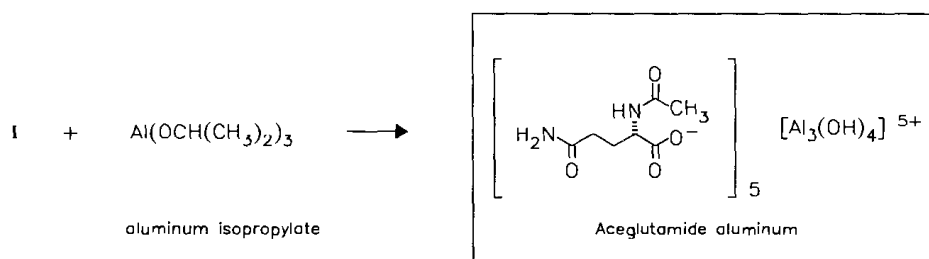
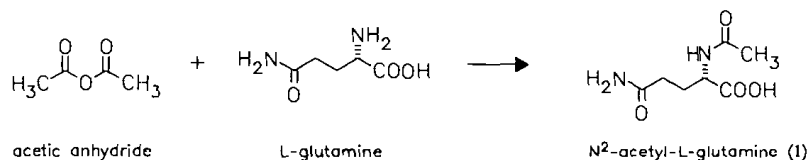
ATC: A02AB; N06B
Use: peptic ulcer therapeutic

RN: 12607-92-0 MF: C₃₅H₅₉Al₃N₁₀O₂₄ MW: 1084.85

LD₅₀: 460 mg/kg (M, i.v.); 13.1 g/kg (M, p.o.);

400 mg/kg (R, i.v.); >14.5 g/kg (R, p.o.)

CN: pentakis(*N*²-acetyl-L-glutaminate)tetrahydroxytrialuminum



Reference(s):

DOS 2 127 176 (Kyowa Hakko; appl. 1.6.1971; J-prior. 5.6.1970).

US 3 787 466 (Kyowa Hakko; 22.1.1974; J-prior. 5.6.1970).

preparation of *N*²-acetyl-L-glutamine:

Reddy, A.V; Ravindranath, B.: Synth. Commun. (SYNCAV) **22** (2), 257 (1992).

Syngé: Biochem. J. (BIJOAK) **33**, 673 (1939).

Formulation(s): gran. 700 mg

Trade Name(s):

J: Glumal (Kyowa Hakko)

Acemetacin

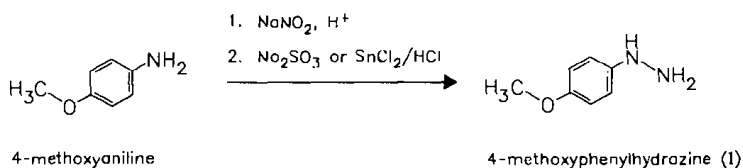
ATC: M01AB11
Use: non-steroidal anti-inflammatory

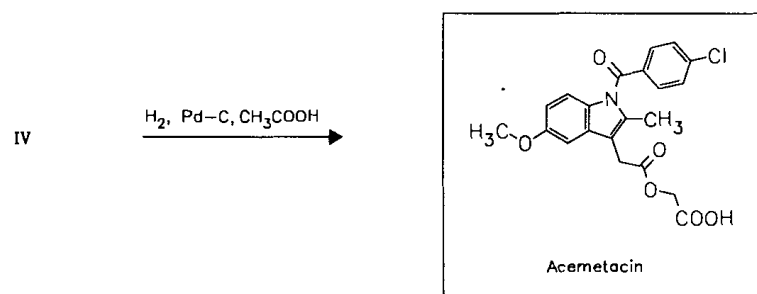
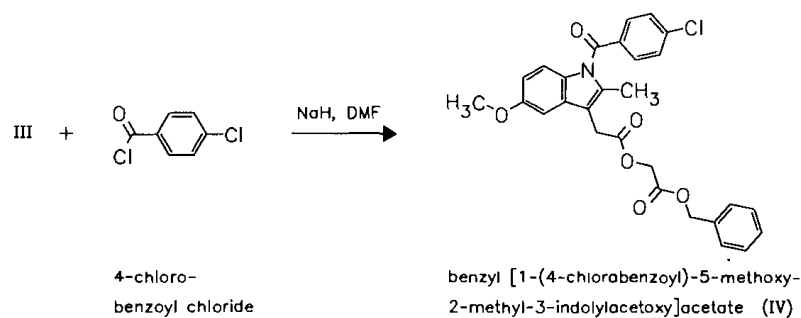
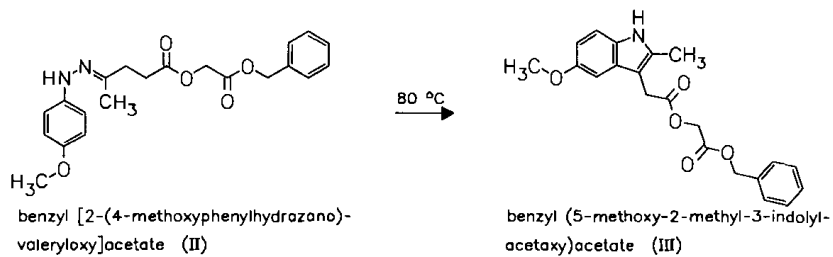
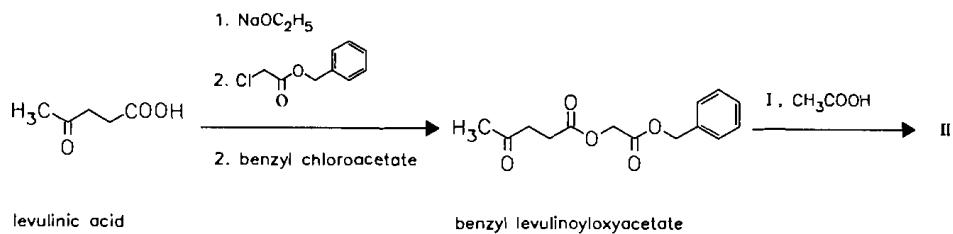
RN: 53164-05-9 MF: C₂₁H₁₈ClNO₆ MW: 415.83 EINECS: 258-403-4

LD₅₀: 55 mg/kg (Mm, p.o.); 18.42mg/kg (Mf, p.o.);

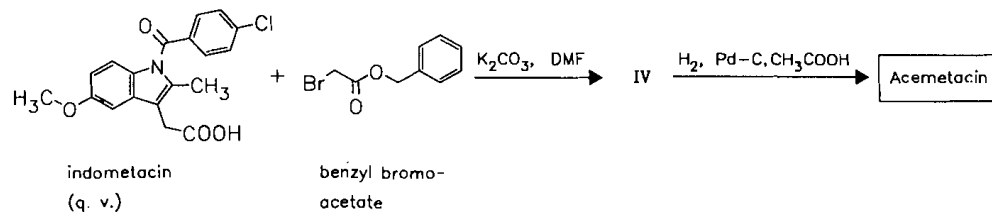
24.2 mg/kg (Rm, p.o.); 30.1 mg/kg (Rf, p.o.)

CN: 1-(4-chlorobenzoyl)-5-methoxy-2-methyl-1*H*-indole-3-acetic acid carboxymethyl ester





b



Reference(s):

DOS 2 234 651 (Tropon; appl. 14.7.1972).

FR 2 192 828 (Tropon; appl. 13.7.1973; D-prior. 14.7.1972).

US 3 910 952 (Troponwerke Dinklage; 7.10.1975; appl. 28.6.1973; D-prior. 14.7.1972).

preparation of 4-methoxyphenylhydrazine from 4-methoxyaniline (*p*-anisidine):

Lee, A.-R. et al.: J. Heterocycl. Chem. (JHTCAD) **32** (1), 1-12 (1995).

Clade, D.W. et al.: J. Chem. Soc., Perkin Trans. 2 (JCPKBH), 909-916 (1982).

DE 70 459 (Riedel; 12.11.1891).

Altschul: Ber. Dtsch. Chem. Ges. (BDCGAS) **25**, 1849 (1892).

preparation of benzyl levulinoyloxyacetate:

Boltze, K.-H.; Brendler, O.; Jacobi, H.; Opitz, W.; Raddatz, S. et al.: Arzneim.-Forsch. (ARZNAD) **30** (8a), 1314-1325 (1980).

Formulation(s): cps. 30 mg, 60 mg; s. r. cps. 90 mg

Trade Name(s):

D: Rantudil (Bayer; 1980)

I: Accmix (Bioprogress)

J: Rantudil (Kowa; 1984)

GB: Emflex (Merck)

Solar (Bioindustria)

Acenocoumarol

(Acenocoumarin; Nicoumalone)

ATC: B01AA07

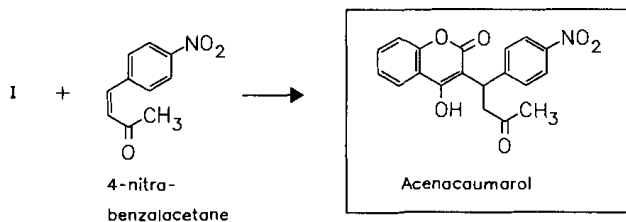
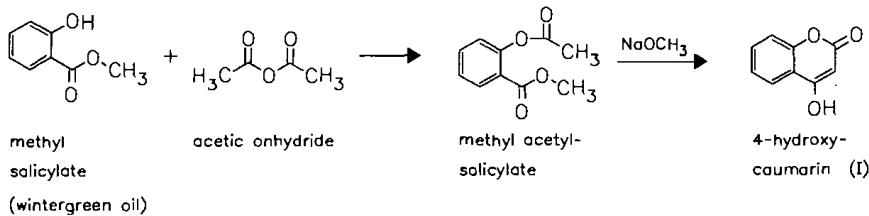
Use: anticoagulant

RN: 152-72-7 MF: C₁₉H₁₅NO₆ MW: 353.33 EINECS: 205-807-3

LD₅₀: 115 mg/kg (M, i.p.); 1470 mg/kg (M, p.o.);

513 mg/kg (R, p.o.)

CN: 4-hydroxy-3-[1-(4-nitrophenyl)-3-oxobutyl]-2H-1-benzopyran-2-one



Reference(s):

US 2 648 862 (Geigy; 1953; CH-prior. 1950).

Formulation(s): tabl. 1 mg, 4 mg

Trade Name(s):

D: Sintrom (Geigy); wfm

GB: Sinthrome (Geigy)

J: Sintrom (Ciba-Geigy)

F: Sintrom (Novartis)

I: Sintrom (Novartis)

USA: Sintrom (Geigy); wfm

Acepromazine

ATC: N05AA04

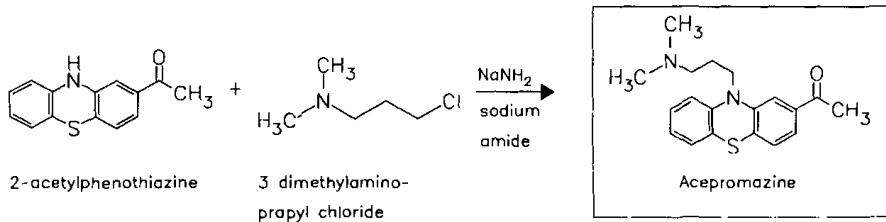
Use: neuroleptic, anti-emetic, tranquilizer

RN: 61-00-7 MF: C₁₉H₂₂N₂OS MW: 326.46 EINECS: 200-496-0LD₅₀: 59 mg/kg (M, i.v.)

CN: 1-[10-[3-(dimethylamino)propyl]-10H-phenothiazin-2-yl]ethanone

maleate (1:1)RN: 3598-37-6 MF: C₁₉H₂₂N₂OS · C₄H₄O₄ MW: 442.54 EINECS: 222-748-9LD₅₀: 65 mg/kg (M, i.v.);

95 mg/kg (R, i.v.); 400 mg/kg (R, p.o.)

**Reference(s):**

DE 1 049 865 (Bayer; appl. 7.9.1955).

Schmitt, J. et al.: Bull. Soc. Chim. Fr. (BSCFAS) **1957**, 938, 1474.**Formulation(s):** drops 1 mg/10 drops; syrup 2.5 mg; tabl. 10 mg (as maleate)**Trade Name(s):**

F: Noctran (Menarini)-comb. J: Plebal (Fujinaga-Sankyo)-comb.

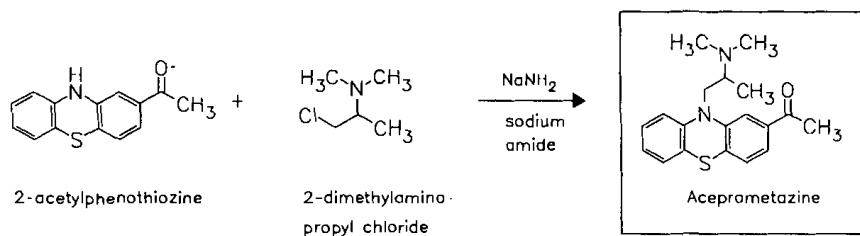
Aceprometazine

ATC: N05AA

Use: neuroleptic, antitussive

RN: 13461-01-3 MF: C₁₉H₂₂N₂OS MW: 326.46 EINECS: 236-661-9LD₅₀: 517 mg/kg (M, p.o.)

CN: 1-[10-[2-(dimethylamino)propyl]-10H-phenothiazin-2-yl]ethanone

maleateRN: 7455-18-7 MF: C₁₉H₂₂N₂OS · C₄H₄O₄ MW: 442.54**Reference(s):**

DE 1 049 865 (Bayer; appl. 7.9.1955).

Formulation(s): tabl. 13.55 mg (as maleate in combination with 400 mg meprobamate)

Trade Name(s):

D: Clindorm (Midy)-comb. Noctran (Menarini)-comb.
 F: Mépronizine (Sanofi)-comb. J: Noctran (Clin-Midy-Sanofi); wfm

Acetarsol

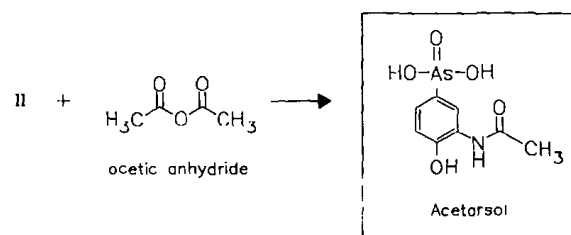
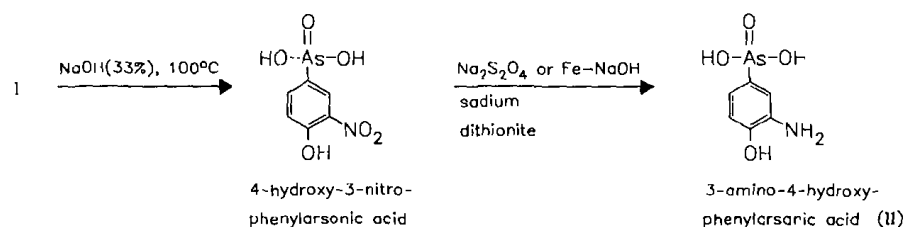
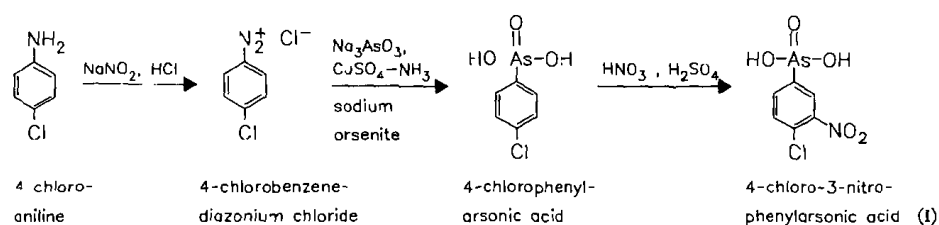
(Acetarsone)

ATC: A07AX02; G01AB01; P01CD02

Use: antiprotozoal (trichomonas)

RN: 97-44-9 MF: C₈H₁₀AsNO₅ MW: 275.09 EINECS: 202-582-3LD₅₀: 180 mg/kg (M, i.v.); 4 mg/kg (M, p.o.)

CN: [3-(acetylamino)-4-hydroxyphenyl]arsonic acid

monosodium saltRN: 5892-48-8 MF: C₈H₉AsNNaO₅ MW: 297.07 EINECS: 227-573-1*Reference(s):*

Raiziss, G.W.; Gavron, J.L.: J. Am. Chem. Soc. (JACSAT) **43**, 583 (1921).
 Raiziss, G.W.; Fisher, B.C.: J. Am. Chem. Soc. (JACSAT) **48**, 1323 (1926).
 DRP 250 264 (H. Bart; appl. 1910).
 DRP 245 536 (Hoechst; appl. 1911).
 DRP 224 953 (Hoechst; appl. 1909).

Formulation(s): collutorium (mouth wash) 0.5 mg/100 g*Trade Name(s):*

F: Arpha collutoire (Fournier)-comb.; wfm
 Collargent acétarsol (Sarbach)-comb.; wfm
 Gynoplix (Doms-Adrian); wfm
 Gynoplix (Théraplix)-comb.; wfm
 Humex collutoire (Fournier)-comb.; wfm
 Humex Fournier collutoire (Fournier)-comb.; wfm

Polygynax (Innothéra)- comb.; wfm	Sanogyl (Pharmascience)- comb.; wfm	I:	Gynoplix (Vaillant)
Polygynax Virgo (Innothéra)-comb.; wfm	Sanogyl (Vilette); wfm	J:	Neo Osvarsan (Banyu)
Pyorex (Bailly-Speab)- comb.; wfm	GB: Pyorex (Bengue)-comb.; wfm		Osvarsan (Banyu)
	S. V. C. (May & Baker)		

Acetazolamide

(Acetazoleamide)

ATC: S01EC01

Use: diuretic

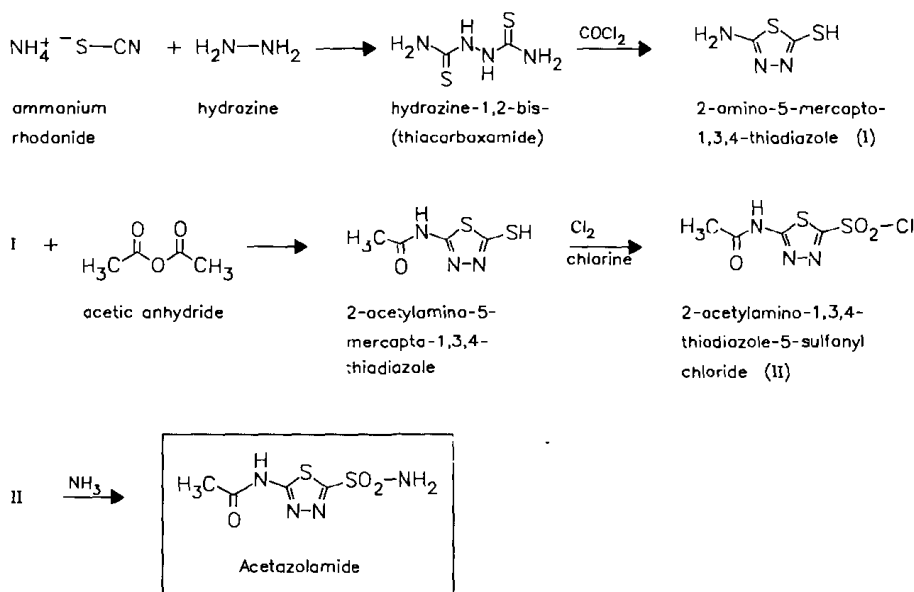
RN: 59-66-5 MF: C₄H₆N₄O₃S₂ MW: 222.25 EINECS: 200-440-5LD₅₀: 1175 mg/kg (M, i.p.); >3000 mg/kg (M, i.v.); 4300 mg/kg (M, p.o.); >3000 mg/kg (M, s.c.);

2750 mg/kg (R, i.p.);

>1500mg/kg (g. p., s.c.)

>2000 mg/kg (dog, i.v.);

CN: N-[5-(aminosulfonyl)-1,3,4-thiadiazol-2-yl]acetamide

*Reference(s):*

US 2 554 816 (American Cyanamid; 1951; prior. 1950).

Roblin, R.O.; Clapp, J.W.: J. Am. Chem. Soc. (JACSAT) **72**, 4890 (1950).*similar process:*

US 2 980 679 (Omikron-Gagliardi; 18.4.1961; I-prior. 4.4.1957).

Formulation(s): amp. 500 mg; cream 10 %; lyo. 500 mg; powder 500 mg; s. r. cps. 500 mg; tabl. 125 mg, 250 mg*Trade Name(s):*

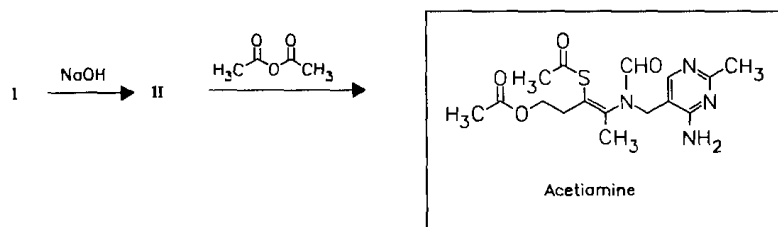
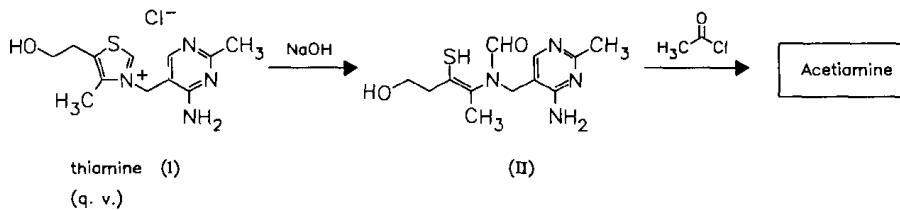
D:	Diamox (Lederle)	Diamox Sustets (Lederle); wfm	Diamox S. R. (Lederle- Takeda)
	Diuramid (medpharm)		
	Glaupax (CIBA Vision)	I: Diamox (Cyanamid)	Didoc (Sawai)
F:	Défiltran (Labs. Jumer)	J: Acetamox (Santen)	Donmox (Hotta)
	Diamox (Thérapiex)	Atenezol (Tsuruhara)	Zohnox (Konto)
GB:	Diamox (Storz)	Diamox (Lederle-Takeda)	USA: Diamox (Lederle)

Acetiamine

ATC: A11
 Use: vitamin B₁-derivative, neurotropic analgesic

RN: 299-89-8 MF: C₁₆H₂₂N₄O₄S MW: 366.44

CN: ethanthioic acid *S*-[1-[2-(acetyloxy)ethyl]-2-[[4-amino-2-methyl-5-pyrimidinyl)methyl]formylamino]-1-propenyl] ester

**Reference(s):**

US 2 752 348 (Takeda; 1956; J-prior. 1952).
 Matsukawa, T.; Kawasaki, H.: Yakugaku Zasshi (YKKZAJ) **23**, 705 (1953).
 Gauthier, B. et al.: Ann. Pharm. Fr. (APFRAD) **21**, 655 (1963).

Formulation(s): drg. 50 mg

Trade Name(s):

D: Thiancurone (Rhône-Poulenc); wfm
 F: Algo-Névriton (Pharmuka); wfm

Acetohexamide

(Cyclamide)

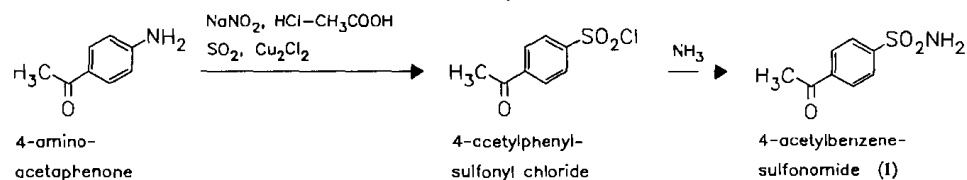
ATC: A10BB31
 Use: antidiabetic

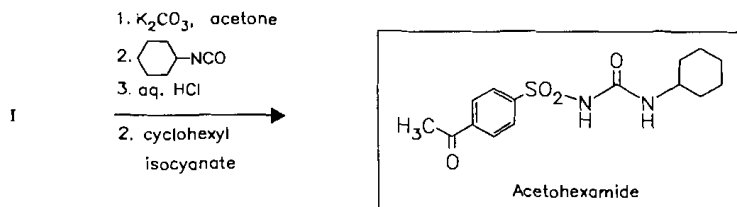
RN: 968-81-0 MF: C₁₅H₂₀N₂O₄S MW: 324.40 EINECS: 213-530-4

LD₅₀: >2500 mg/kg (M, p.o.);

5g/kg (R, p.o.)

CN: 4-acetyl-*N*-[(cyclohexylamino)carbonyl]benzenesulfonamide



*Reference(s):*

US 3 320 312 (Lilly; 16.5.1967; prior. 28.4.1960).
 DE 1 177 631 (Lilly; appl. 21.4.1961; USA-prior. 28.4.1960).
 DE 1 135 891 (Hoechst; appl. 30.6.1960).

Formulation(s): tabl. 250 mg, 500 mg

Trade Name(s):

GB: Dimelor (Lilly); wfm J: Dimelin (Shionogi)
 I: Dimelor (Lilly); wfm USA: Dymelor (Lilly)

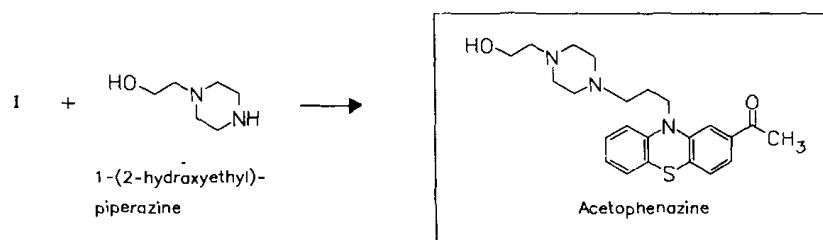
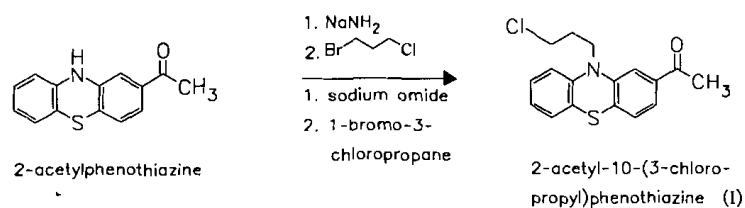
Acetophenazine

ATC: N05AB07
 Use: neuroleptic, antipsychotic

RN: 2751-68-0 MF: $C_{23}H_{29}N_3O_2S$ MW: 411.57
 CN: 1-[10-[3-[4-(2-hydroxyethyl)-1-piperazinyl]propyl]-10H-phenothiazin-2-yl]ethanone

maleate (1:2)

RN: 5714-00-1 MF: $C_{23}H_{29}N_3O_2S \cdot 2C_4H_4O_4$ MW: 643.71 EINECS: 227-202-3
 LD₅₀: 71 mg/kg (M, i.v.);
 60 mg/kg (R, i.p.); 39 mg/kg (R, i.v.); 415 mg/kg (R, p.o.)

*Reference(s):*

US 2 985 654 (Schering Corp.; 23.5.1961; prior. 21.9.1956).

Formulation(s): tabl. 20 mg (as dimaleate)

Trade Name(s):

USA: Tindal (Schering); wfm

Acetorphan

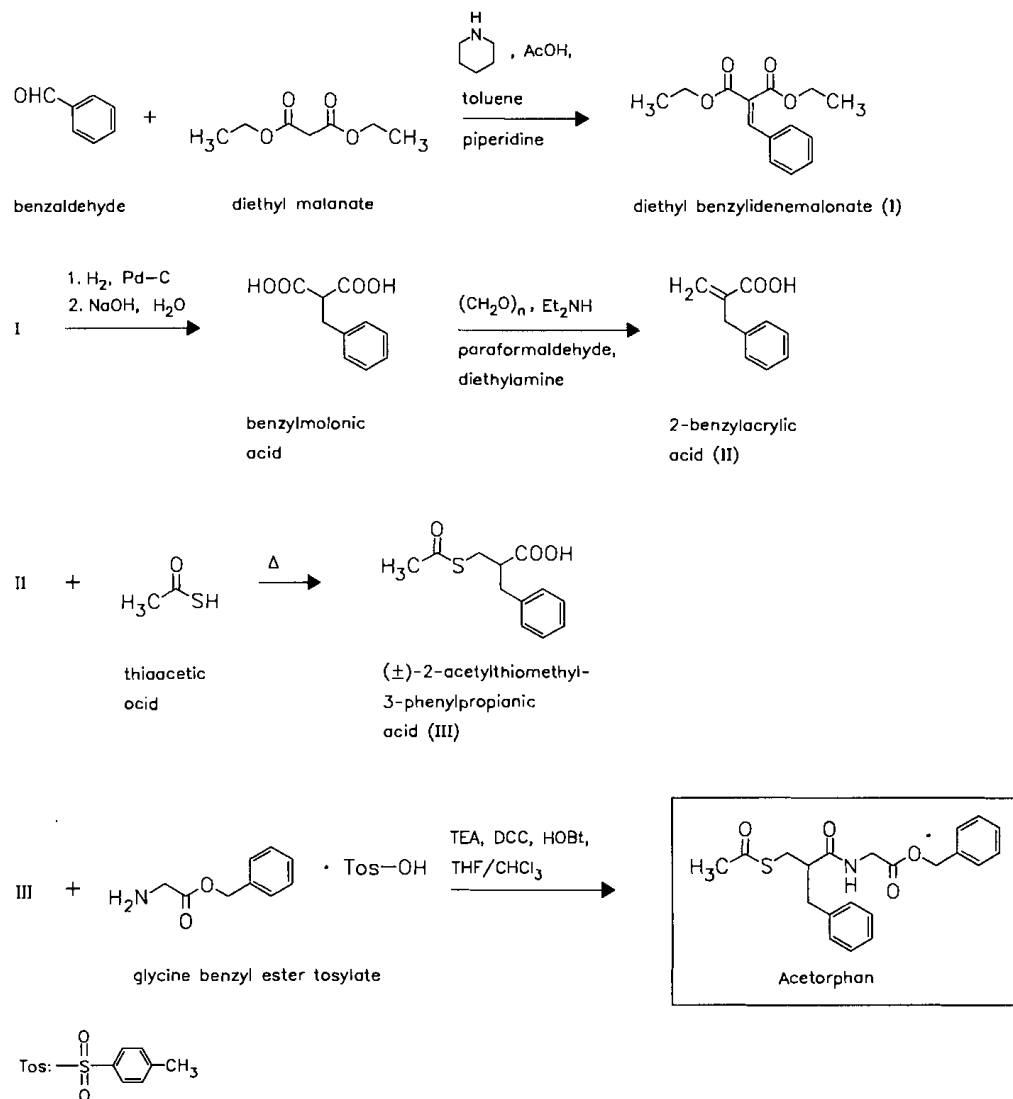
(Racecadotril)

ATC: A07XA04

Use: antisecretory, cnkephalinaseinhibitor

RN: 81110-73-8 MF: C₂₁H₂₃NO₄S MW: 385.48

CN: (±)-N-[2-[(Acetylthio)methyl]-1-oxo-3-phenylpropyl]glycine phenylmethyl ester

*Reference(s):*

EP 38 758 (Roques, B. et al.; appl. 17.4.1981; F-prior. 17.4.1980).

EP 729 936 (Soc. Civile Bioprojet; appl. 1.3.1996; F-prior. 3.3.1995).

*synthesis of III:*Mannich, C.; Ritsert, K.; Ber. Dtsch. Chem. Ges. (BDCGAS) **57**, 1116 (1924).*Formulation(s):* cps. 100 mg*Trade Name(s):*

F: Tiorfan (Bioprojet; 1993)

Acetrizoic acid

ATC: V08AA07

Use: X-ray contrast medium

RN: 85-36-9 MF: $C_9H_6I_3NO_3$ MW: 556.86 EINECS: 201-600-7LD₅₀: 8000 mg/kg (M, i.v.); 20 g/kg (M, p.o.)

CN: 3-(acetylamino)-2,4,6-triiodobenzoic acid

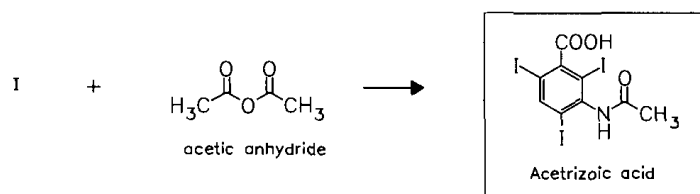
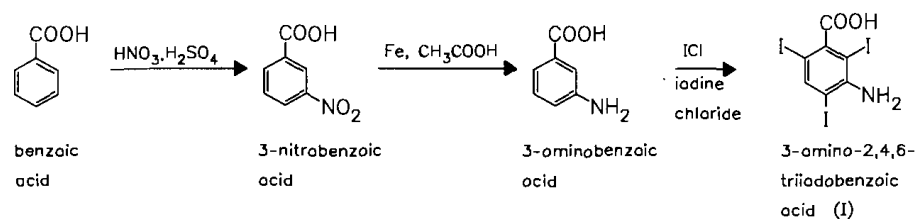
meglumine salt (1:1)RN: 22154-43-4 MF: $C_9H_6I_3NO_3 \cdot C_7H_{17}NO_5$ MW: 752.08LD₅₀: 10.1 g/kg (M, i.v.)**sodium salt**RN: 129-63-5 MF: $C_9H_5I_3NNaO_3$ MW: 578.85 EINECS: 204-956-1LD₅₀: 12156 mg/kg (M, i.m.); 7800 mg/kg (M, i.v.);

6400 mg/kg (R, i.v.);

5200 mg/kg (rabbit, i.v.);

5600 mg/kg (cat, i.v.);

6300 mg/kg (dog, i.v.)

**Reference(s):**

US 2 611 786 (Mallinckrodt; 1952; appl. 1950; prior. 21.7.1948).

Wallingford et al.: J. Am. Chem. Soc. (JACSAT) **74**, 4365 (1952).**3-amino-2,4,6-triiodobenzoic acid:**Kretzer: Ber. Dtsch. Chem. Ges. (BDCGAS) **30**, 1944 (1897).**Formulaion(s):** vial. 250 mg/ml, 500 mg/ml**Trade Name(s):**

F: Vasurix (Guerbet); wfm

J: Diaginol (Banyu); wfm

Pyelokon-R

GB: Diaginol (May & Baker); wfm

USA: Cystocon (Mallinckrodt); wfm

(Mallinckrodt); wfm
Salpix (Ortho); wfm**Acetylcholine chloride**

ATC: S01EB09

Use: parasympathomimetic, miotic, vasodilator (peripheral)

RN: 60-31-1 MF: $C_7H_{16}ClNO_2$ MW: 181.66 EINECS: 200-468-8LD₅₀: 10 mg/kg (M, i.v.); 3 g/kg (M, p.o.);

22 mg/kg (R, i.v.); 2500 mg/kg (R, p.o.)

CN: 2-(acetyloxy)-N,N,N-trimethylethanaminium chloride

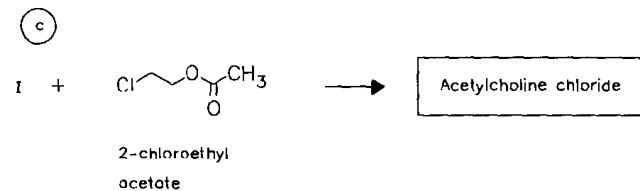
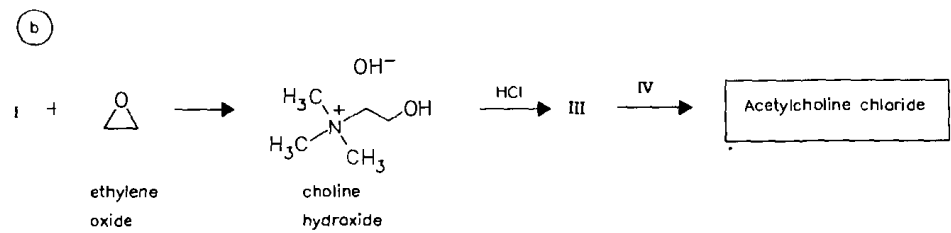
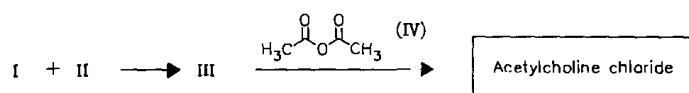
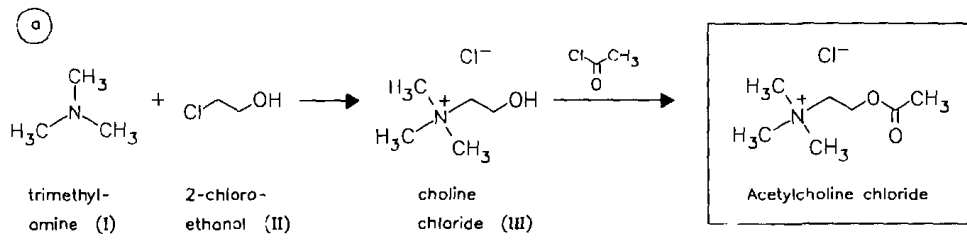
hydroxide

RN: 56-13-3 MF: C₇H₁₇NO₃ MW: 163.22

bromide

RN: 66-23-9 MF: C₇H₁₆BrNO₂ MW: 226.11 EINECS: 200-622-4

LD₅₀: 170 mg/kg (M, s.c.)



Reference(s):

Baeyer, A. v.: Justus Liebigs Ann. Chem. (JLACBF) **142**, 235 (1867).
 Nothnagel: Arch. Pharm. (Weinheim, Ger.) (ARPMAS) **232**, 265 (1894).
 Fourneau, E.; Page, H.J.: Bull. Soc. Chim. Fr. (BSCFAS) [4] **15**, 544 (1914).
 DE 801 210 (BASF; appl. 1948).
 US 1 957 443 (Merck & Co.; 1934; appl. 1931).
 US 2 012 268 (Merck & Co.; 1935; appl. 1931).
 US 2 013 536 (Merck & Co.; 1935; appl. 1931).

Formulation(s): amp. 20 mg; eye drops 1 %

Trade Name(s):

D:	Miochol-E (CIBA Vision)	J:	Acetylcholine (Roche)
I:	Farmigea acetilcolina (Farmigea); wfm		Neucholin-A (Zeria); wfm
			Ovisot (Daiichi); wfm

Acetylcysteine

ATC: R05CB01; S01XA08; V03AB23
 Use: mucolytic agent

RN: 616-91-1 MF: C₅H₉NO₃S MW: 163.20 EINECS: 210-498-3

LD₅₀: 400 mg/kg (M, i.p.); 3800 mg/kg (M, i.v.); 7888 mg/kg (M, p.o.);
 1140 mg/kg (R, i.v.); 5050 mg/kg (R, p.o.);
 700 mg/kg (dog, i.p.); 700 mg/kg (dog, i.v.); >1 g/kg (dog, p.o.)

CN: N-acetyl-L-cysteine

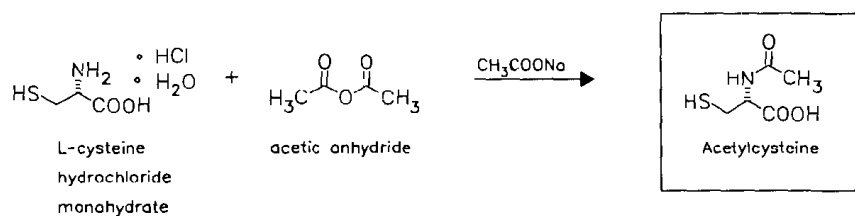
monosodium salt

RN: 19542-74-6 MF: C₅H₈NNaO₃S MW: 185.18 EINECS: 243-143-6

LD₅₀: 3800 mg/kg (M, i.v.);
 2559 mg/kg (R, i.v.)

monoammonium salt

RN: 50807-78-8 MF: C₅H₉NO₃S · H₃N MW: 180.23

**Reference(s):**

US 3 091 569 (Mead Johnson; 28.5.1963; appl. 26.8.1960).
 US 3 184 505 (Mead Johnson; 18.5.1965; appl. 18.6.1962).
 Smith, H.A.; Gorin, G.: J. Org. Chem. (JOCEAH) **26**, 820 (1961).

ammonium salt (mucolysis of bronchial mucus by nebulization):

DOS 2 305 271 (Bristol-Myers; appl. 2.2.1973; USA-prior. 3.2.1972).

Formulation(s): amp. 300 mg (as monosodium salt); cps. 200 mg; eff. tabl. 100 mg, 200 mg, 600 mg; f. c. tabl. 100 mg, 200 mg, 600 mg; gran. 10 mg, 100 mg, 200 mg, 600 mg; lyo. for syrup 100 mg; syrup 200 mg/10 ml; tabl. 100 mg, 200 mg, 600 mg

Trade Name(s):

D:	ACC (Hexal)	Fluimucil (Zambon)	GB:	Ilube (Alcon)-comb.
	Acemuc (betapharm)	Fluimucil Antibiotic 750 (Zambon)		Parvolex (Evans)
	Fluimucil-100/-200 (Zambon)	Genac (Génévrier)	I:	Brunac (Bruschettini)
	Rinofluimucil (Inpharzam)-comb.	Mucolator (Abbott)		Fluimucil (Zambon)
	numerous combination and generic preparations	Mucomyst (Bristol-Myers Squibb)		Mucisol (Deca)
F:	Broncoclar (Oberlin)	Mucothiol (SCAT)	J:	Rinofluimucil (Zambon)-comb.
	Codotussyl (Whitchall)	Rhinofluimucil (Débat)-comb.		Acetein (Senju)
	Euronac (Europhtha)	Solmucol (Génévrier)	USA:	Mucofilin Sol. (Eisai)
	Exomuc (Bouchara)	Tixair (Byk)		Mucositol (Dey)

Acetyldigitoxin

ATC: C01AA01

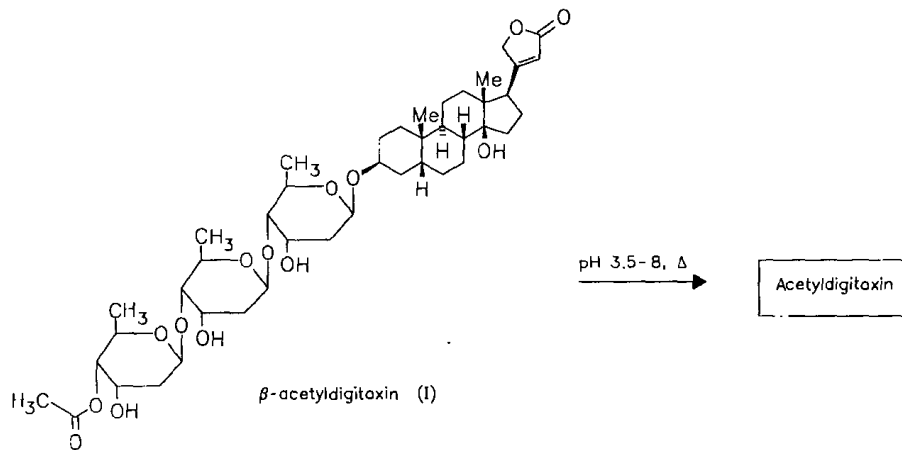
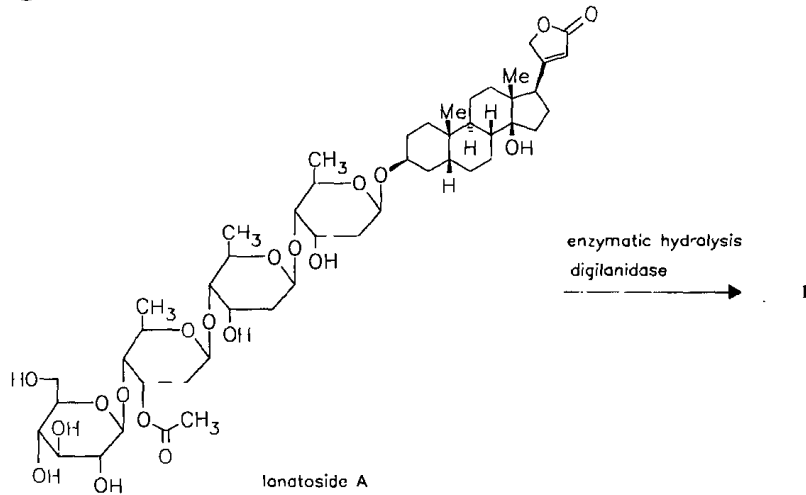
Use: cardiotonic, cardiac glycoside

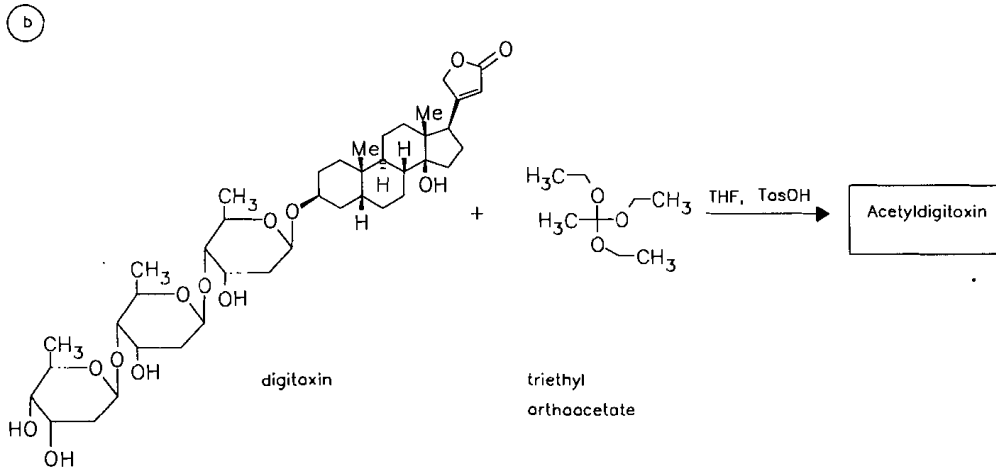
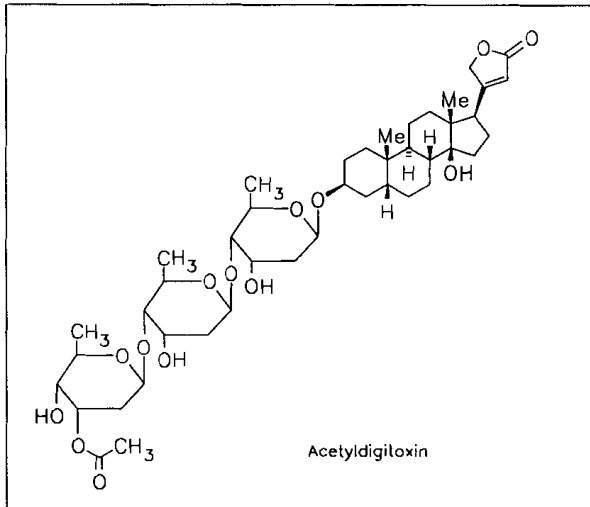
RN: 1111-39-3 MF: C₄₃H₆₆O₁₄ MW: 806.99 EINECS: 214-178-4LD₅₀: >30 mg/kg (g. p., p.o.);

514 µg/kg (cat, i.v.); 250 µg/kg (cat, p.o.)

CN: (3β,5β)-3-[(*O*-3-*O*-acetyl-2,6-dideoxy-β-*D*-ribo-hexopyranosyl-(1→4)-*O*-2,6-dideoxy-β-*D*-ribo-hexopyranosyl-(1→4)-2,6-dideoxy-β-*D*-ribo-hexopyranosyl)oxy]-14-hydroxycard-20(22)-enolide

a



**Reference(s):**

- a Stoll, A. et al.: *Helv. Chim. Acta (HCACAV)* **34**, 397 (1951).
 Gisvold, O.: *J. Pharm. Sci. (JPMSAE)* **61**, 1320 (1972).
 IIU 155 716 (Richter Gedeon; appl. 20.1.1968).
 DE 925 047 (Sandoz; appl. 1954; CH-prior. 1952).
 b DE 2 010 422 (Boehringer Ing.; appl. 5.3.1970).

alternative synthesis:

DE 2 206 737 (Boehringer Mannh.; appl. 12.2.1972) (α -Acetyldigoxin, q. v.).

Formulation(s): tabl. 0.2 mg

Trade Name(s):

D: Acylanid (Sandoz); wfm F: Acylanid (Sandoz); wfm USA: Acylanid (Sandoz); wfm

 α -Acetyldigoxin

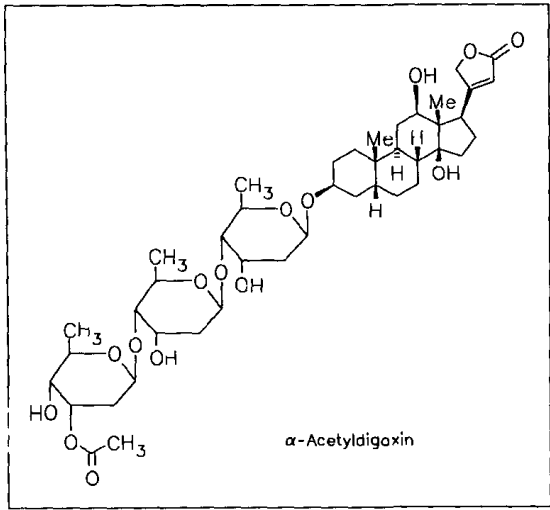
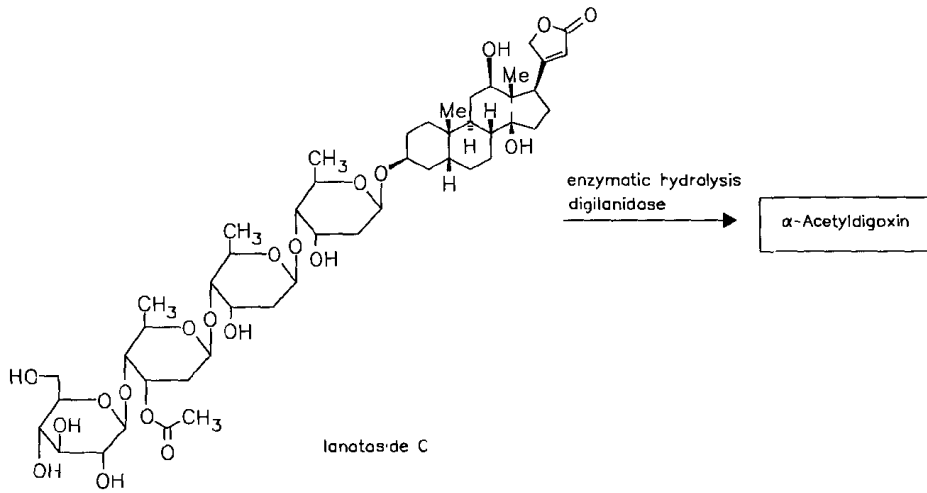
ATC: C01AA02
 Use: cardiotonic, cardiac glycoside

RN: 5511-98-8 MF: C₄₃H₆₆O₁₅ MW: 822.99 EINECS: 226-855-1

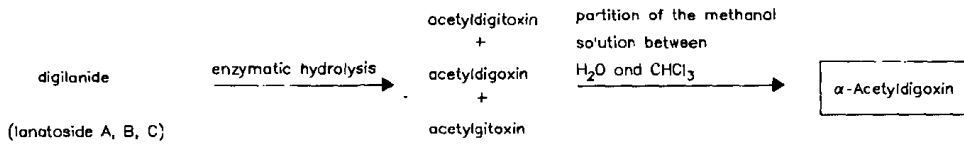
LD₅₀: 3300 μ g/kg (g. p., p.o.);
 200 μ g/kg (cat, p.o.)

CN: (3 β ,5 β ,12 β)-3-[(O-3-O-acetyl-2,6-dideoxy- β -D-ribo-hexopyranosyl)-(1 \rightarrow 4)-O-2,6-dideoxy- β -D-ribo-hexopyranosyl-(1 \rightarrow 4)-2,6-dideoxy- β -D-ribo-hexopyranosyl]oxy]-12,14-dihydroxycard-20(22)-enolide

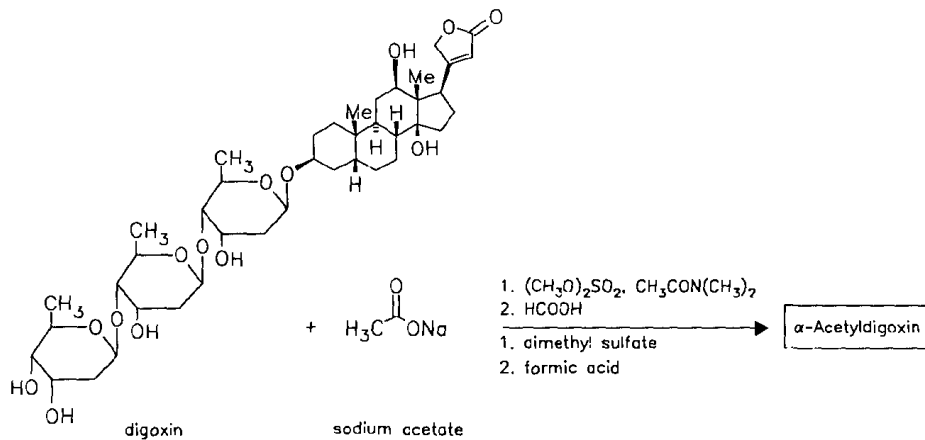
a



b



c

**Reference(s):**

- a** Fieser, L.F.; Fieser, M.: Steroide, p. 801, Verlag Chemie, Weinheim [1961].
b GB 1 162 614 (Heilmittelwerke Wien; appl. 1.2.1968; A-prior. 7.2.1967).
 Gisvold, O.: J. Pharm. Sci. (JPMSAE) **61**, 1320 (1972).

alternative syntheses:

DE 2 010 422 (Boehringer Ing.; appl. 5.3.1970). (Acetyldigoxin, q. v.).
 Rietbrock, N.; Kuhlmann, J.: Naunyn-Schmiedeberg's Arch. Pharmacol. (NSAPCC) **279**, 413 (1973).

Formulation(s): sol. 0.5 mg/ml; tabl. 0.25 mg, 0.2 mg

Trade Name(s):

D:	Card-Hydergin (Sandoz)- comb.; wfm	Lanadigin (Promonta); wfm	Nitro-Sandolanid (Sandoz)- comb.; wfm
	Digi-Complamin (Beecham-Wülfing)-comb.; wfm	Lanadigin EL (Promonta); wfm	Sandolanid (Sandoz)
		Lanadigin + Theophyllin (Promonta)-comb.; wfm	F: Acygoxine (Sandoz); wfm I: Cedigossina (Sandoz)

 β -Acetyldigoxin

ATC: C01AA02

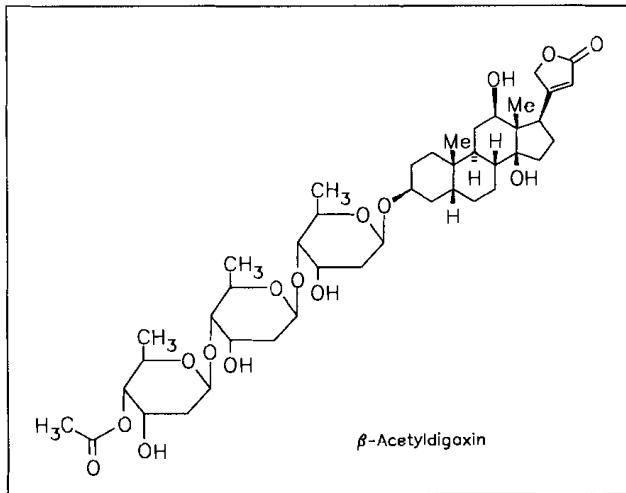
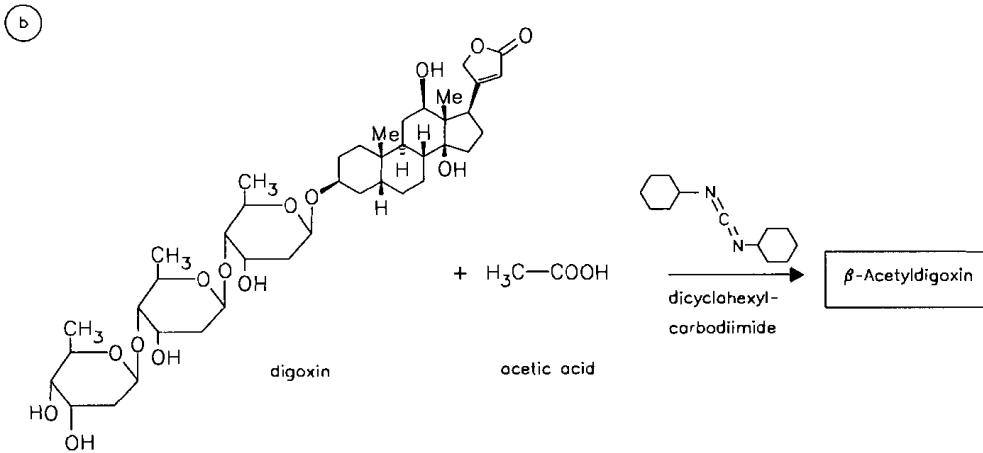
Use: cardiotonic, cardiac glycoside

RN: 5355-48-6 MF: $\text{C}_{43}\text{H}_{66}\text{O}_{15}$ MW: 822.99 EINECS: 226-337-5

LD₅₀: 2400 $\mu\text{g}/\text{kg}$ (g. p., p.o.);
 422 $\mu\text{g}/\text{kg}$ (dog, p.o.)

CN: (3 β ,5 β ,12 β)-3-[(O-4-O-acetyl-2,6-dideoxy- β -D-ribo-hexopyranosyl-(1 \rightarrow 4))-O-2,6-dideoxy- β -D-ribo-hexopyranosyl-(1 \rightarrow 4))-2,6-dideoxy- β -D-ribo-hexopyranosyl]oxy]-12,14-dihydroxycard-20(22)-enolide

a isolation and extraction from the leaves of *Digitalis lanata*



Reference(s):

- a Hopponen, R.E.; Gisvold, O.: *J. Am. Pharm. Assoc. (JPHAA3)* **41**, 146 (1952).
- Rangaswami, S. et al.: *Indian J. Pharm. (IJPAAO)* **17**, 253 (1955).
- b HU 7 147 (Richter Gedeon; appl. 5.6.1972).

alternative syntheses:

- Haberland, G.: *Arzneim.-Forsch. (ARZNAD)* **15**, 481 (1965).
- Graf, E.; Pfaff, J.: *Arch. Pharm. (Weinheim, Ger.) (ARPMAS)* **307**, 943 (1974).
- DOS 2 826 532 (LEK tovarna farm.; appl. 16.6.1978; YU-prior. 22.6.1977).

medical use:

DOS 1 921 307 (Boehringer Ing.; appl. 25.4.1969) addition to DOS 1 767 553.

Formulation(s): tabl. 0.1 mg, 0.2 mg

Trade Name(s):

<p>D: Beta-Acetyldigoxin (ratiopharm)</p> <p>Beta-Acetyldigoxin R.A.N. = glycotop (R.A.N.)</p>	<p>Beta-Acetyldigoxin-ratiopharm 0,1 mg/0,2 mg (ratiopharm)</p> <p>Digostada 0.2/-mite (Stadapharm)</p> <p>Digostade (Stada)</p>	<p>Digotab (ASTA Medica AWD)</p> <p>Digox (ct-Arzneimittel)</p> <p>Digoxin-Didier (Hormosan)</p> <p>Gladixol (Corax)</p>
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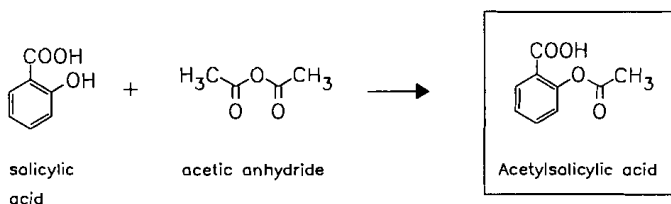
Kardiamed (Medice)	I:	numerous combination preparations Beta-Acigoxia (Inverni della Beffa); wfm	Cardioreg (Nattermann); wfm
Novodigal (Beiersdorf)			
Stillacor (Wolff)			

Acetylsalicylic acid

(Acidum acetylsalicylicum; Aspirin)

ATC: A01AD05; B01AC06; M01BA03;
N02BA01; N02BA51Use: analgesic, antipyretic, antirheumatic,
platelet aggregation inhibitor

RN: 50-78-2 MF: C₉H₈O₄ MW: 180.16 EINECS: 200-064-1
 LD₅₀: 280 mg/kg (M, i.p.); 250 mg/kg (M, p.o.); 1520 mg/kg (M, s.c.);
 340 mg/kg (R, i.p.); 200 mg/kg (R, p.o.); 1600 mg/kg (R, s.c.);
 1075 mg/kg (g. p., p.o.);
 1010 mg/kg (rabbit, p.o.);
 681 mg/kg (dog, i.v.); 700 mg/kg (dog, p.o.)
 CN: 2-(acetyloxy)benzoic acid

aluminum saltRN: 147-31-9 MF: C₂₇H₂₁AlO₁₂ MW: 564.44**calcium salt**RN: 69-46-5 MF: C₁₈H₁₄CaO₈ MW: 398.38 EINECS: 200-707-6**lithium salt**RN: 552-98-7 MF: C₉H₇LiO₄ MW: 186.09 EINECS: 209-029-5**sodium salt**RN: 493-53-8 MF: C₉H₇NaO₄ MW: 202.14 EINECS: 207-777-7LD₅₀: 730 mg/kg (M, i.p.);
1450 mg/kg (R, i.p.)**magnesium salt**RN: 132-49-0 MF: C₁₈H₁₄MgO₈ MW: 382.61 EINECS: 205-062-4LD₅₀: 620 mg/kg (M, s.c.)**lysine salt (1:1)**RN: 62952-06-1 MF: C₉H₈O₄ · C₆H₁₄N₂O₂ MW: 326.35LD₅₀: 950 mg/kg (M, i.v.); 3270 mg/kg (M, p.o.);
1525 mg/kg (R, i.v.); 4350 mg/kg (R, p.o.)**Reference(s):**

Ullmanns Encykl. Tech. Chem., 3. Aufl., Vol. 13, 90.
 US 3 235 583 (Norwich Pharmacal; 15.2.1966; appl. 22.7.1964).

acetylation in presence of pyridine for avoidance of formation of acetylsalicylic anhydride and acetylsalicylsalicylic acid:

DOS 2 635 540 (A. L. de Week, H. Bundgaard; appl. 6.8.1976).

acetylation in presence of H₂SO₄:

US 2 731 492 (J. Kamlet; 1956; appl. 1954).

crystallization:

US 2 890 240 (Monsanto; 1959; appl. 1957).

aluminum salts:

DRP 585 986 (Chinoin; appl. 1931; H.-prior. 1931).
 US 2 698 332 (Reheis Comp.; 1954; appl. 1951).
 US 2 918 485 (Keystone Chemurgic Corp.; 1959; appl. 1955).
 GB 888 666 (Hardman & Holden; appl. 1959).

aluminum acetylsalicylate glutamate:

DOS 2 909 829 (Kyowa Hakko; appl. 13.3.1979; J.-prior. 13.3.1978).

Formulation(s): cps. 325 mg, 500 mg, suppos. 125 mg, 150 mg, 300 mg; tabl. 50 mg, 75 mg, 100 mg, 300 mg, 500 mg

Trade Name(s):

D:	Alka-Seltzer (Bayer)	Aspirine Vitamine C (Oberlin)-comb.	Alupir (Farmacologico Milanese; as aluminum salt)
	Aspirin (Bayer; 1899)	Aspirisucré (Arkomedika)	Aspergum (Farmades)
	Aspisol (Bayer; as DL-lysine salt)	Aspro (Nicholas)	Aspirina (Bayer)
	Aspro (Roche Nicholas)	Catalgine (Schwarz)	Aspirinetta (Bayer)
	ASS Dura (durachemie)	Claragine (Nicholas)	Aspro (Roche)
	ASS-ratiopharm (ratiopharm)	Kardégic (Synthélabo)	Bufferin (Bristol-Myers Squibb)
	Godamed (Pfleger)	Rhonal (Théraplax)	Cemirit (Bayer)
	Micristin (OPW)	Sargépirine (ASTA Médica)	Endydol (Guidotti)
	Miniasal (OPW)	Solupsan (UPSA)	Kilios (Carlo Erba)
	Romigal (Romogal-Werk)	numerous combination preparations	numerous combination preparations
	Santasal (Merckle)	GB: Angettes (Bristol-Myers)	J: generic preparations
	Togal (Togal)	Aspan (Hoechst)-comb.	USA: Acuprin (Richwood)
	numerous combination preparations	Aspirin (Bayer)	Ecotrin (SmithKline Beecham Consumer)
F:	Actron (Bayer)-comb.	Caprin (Sinclair)	Equagesic (Wyeth-Ayerst)
	Afebry (Galephar)-comb.	Disprin CO (Reckitt & Colman)	Fiorinal (Novartis)
	Alka-Seltzer (Bayer)-comb.	Nu-Seals Aspirin (Lilly)	Halfprin (Kramer)
	Antigrippine (SmithKline Beecham)-comb.	Post MI (Ashbourne)	Norgeric (3M)
	Aspégic 500 (Synthélabo; as lysine salt)	numerous combination preparations	Percotan (Endo)
	Aspirine Bayér (Bayer)	I: Ac Acsal (Formulario Naz.; Tariff. Nazionale; Scfm; Iema; Farmacologico Milanese)	Roboxisal (Robins)
	Aspirine duRhône (Bayer)		
	Aspirine pH 8 (3M Santé)		
	Aspirine Upsa (UPSA)		
	Aspirine Upsa Vitamine C (UPSA)-comb.		

Acetylsulfafurazole

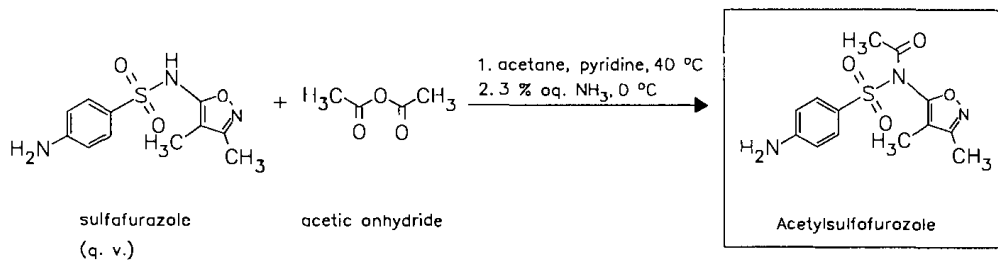
(Acetylsulfisoxazole; Sulfisoxazole Acetyl)

ATC: S01AB

Use: antibacterial

RN: 80-74-0 MF: C₁₃H₁₃N₃O₄S MW: 309.35 EINECS: 201-305-3

CN: N-[(4-aminophenyl)sulfonyl]-N-(3,4-dimethyl-5-isoxazolyl)acetamide

**Reference(s):**

US 2 721 200 (Roche; 1955; appl. 1953).

Formulation(s): susp. 500 mg/5 ml**Trade Name(s):**

USA: Eryzole (Alra)

Pediazole (Ross)

Acexamic acid

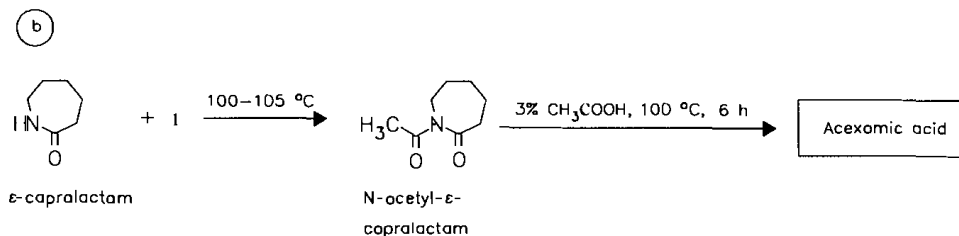
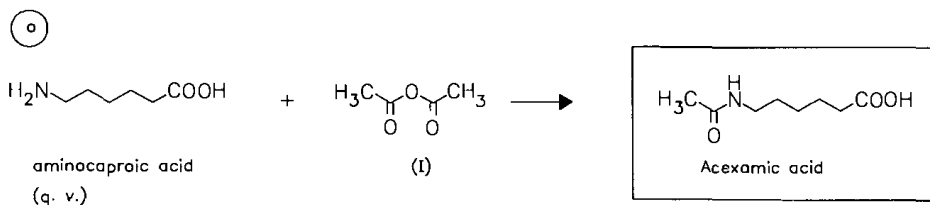
(Acide acexamique)

ATC: D03A

Use: antifibrinolytic

RN: 57-08-9 MF: $C_8H_{15}NO_3$ MW: 173.21 EINECS: 200-310-8

CN: 6-(acetylamino)hexanoic acid

sodium saltRN: 7234-48-2 MF: $C_8H_{14}NNaO_3$ MW: 195.19 EINECS: 230-635-0**Reference(s):**

Offe, H.A.: Z. Naturforsch., B: Anorg. Chem., Org. Chem., Biochem., Biophys., Biol. (ZENBAX) 2, 182 (1947).

FR-M 2 332 (Rowa; appl. 1963).

Formulation(s): amp. 5 g (as sodium salt); cps. 300 mg (as zinc salt); ointment 5 % (as sodium salt); susp. 300 mg (as zinc salt)**Trade Name(s):**

F: Plasténan (Isopharm)

Plasténan Néomycine (Isopharm)-comb.

I: Plastenan (Italfarmaco); wfm

Aciclovir

(Acyclovir; Acycloguanosine)

ATC: D06BB03; J05AB01; S01AD03

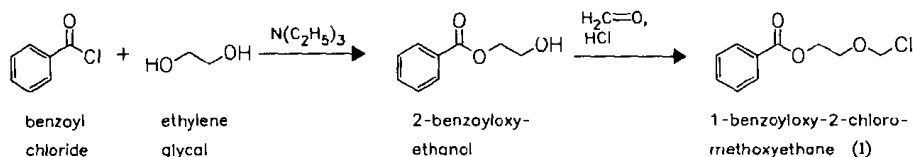
Use: antiviral

RN: 59277-89-3 MF: $C_8H_{11}N_5O_3$ MW: 225.21 EINECS: 261-685-1LD₅₀: 1000 mg/kg (M, i.p.); 1118 mg/kg (M, i.v.); >10000 mg/kg (M, p.o.); 1118 mg/kg (M, s.c.);
860 mg/kg (R, i.p.); 910 mg/kg (R, i.v.); >20000 mg/kg (R, p.o.); 620 mg/kg (R, s.c.)

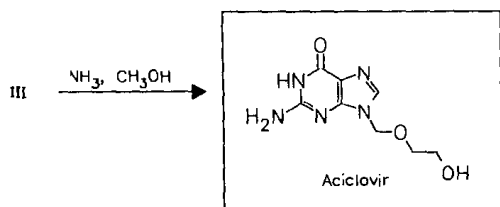
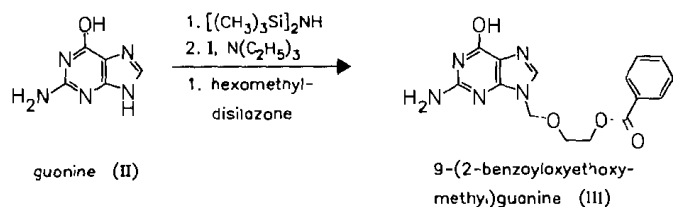
CN: 2-amino-1,9-dihydro-9-[(2-hydroxyethoxy)methyl]-6H-purin-6-one

monosodium saltRN: 69657-51-8 MF: $C_8H_{10}N_5NaO_3$ MW: 247.19LD₅₀: 999 mg/kg (M, i.p.); >10000 mg/kg (M, p.o.);

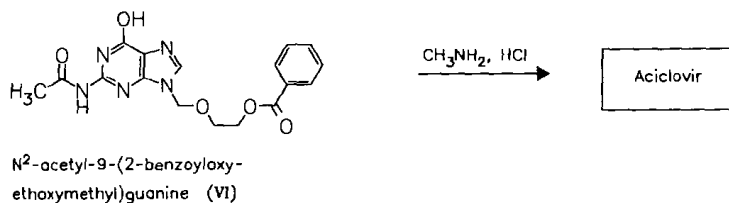
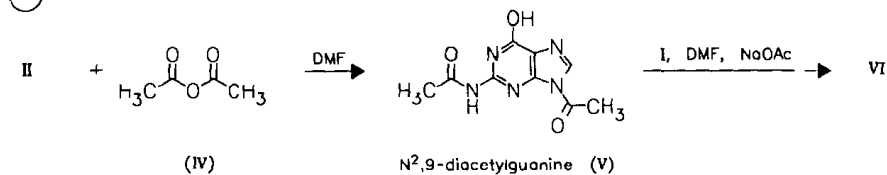
1210 mg/kg (R, i.p.); >600 mg/kg (R, i.v.); >20000 mg/kg (R, p.o.); 650 mg/kg (R, s.c.)



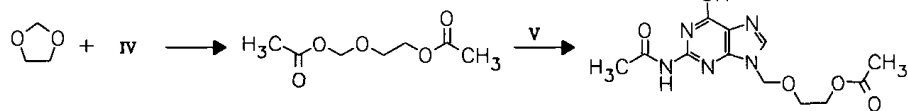
a



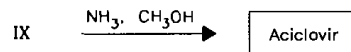
b



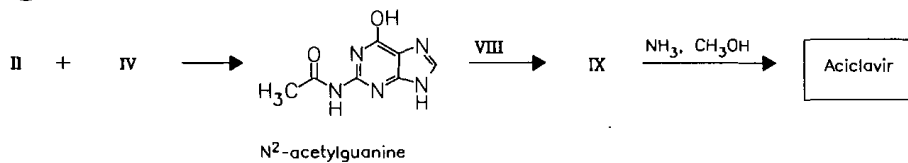
c

1,3-dioxo-
lone (VII)2-acetoxyethyl
acetoxymethyl ether (VIII)

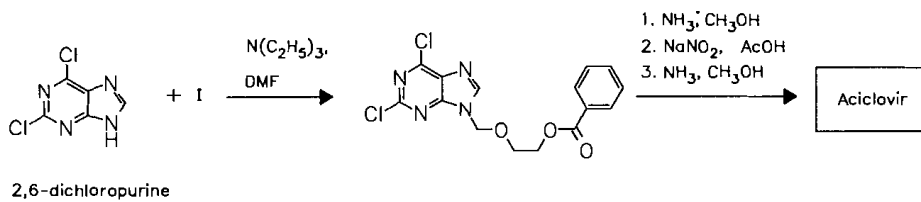
"diacetylaciclovir" (IX)



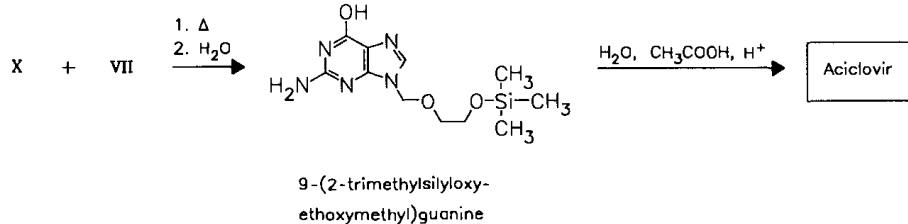
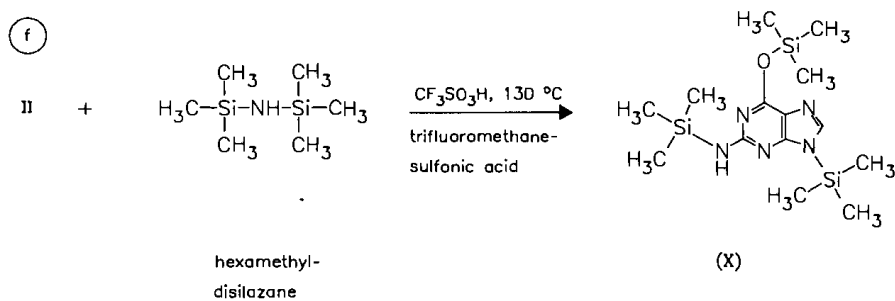
d



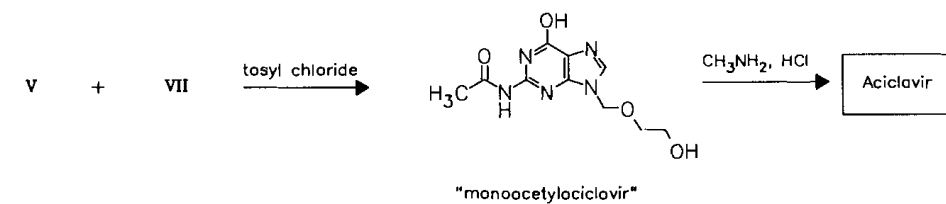
e



f



g



Reference(s):

- Schaeffer, H.J. et al.: Nature (London) (NATUAS) **272**, 583 (1978).
 DE 2 539 963 (Wellcome; appl. 2.9.1975; GB-prior. 2.9.1974).
 US 4 199 574 (Wellcome; 22.4.1980; GB-prior. 2.9.1974).
 GB 1 523 865 (Burroughs Wellcome; GB-prior. 2.9.1974).
 c GB 1 567 671 (Wellcome; appl. 26.8.1977; USA-prior. 27.8.1976).
 Matsumoto, H. et al.: Chem. Pharm. Bull. (CPBTAL) **36**, 1153 (1988).
 f EP 709 385 (Roche; appl. 13.7.1995; USA-prior. 26.7.1994, 27.4.1995).

alternative synthesis from 4-aminoimidazole-5-carboxamide:

WO 9 011 283 (GEA Farm.; 4.10.1990; DK-prior. 20.3.1989).

alternative synthesis via formylguanine:

WO 9 507 281 (Recordati; appl. 3.2.1994; I-prior. 10.9.1993).

synthesis using 1,3-dioxolane:

US 5 567 816 (Syntex; appl. 27.4.1995; USA-prior. 27.7.1994).

improved procedures:

- DE 19 536 164 (Boehringer Ingelheim; D-prior. 28.9.1995).
 WO 9 724 357 (Mallinckrodt; appl. 17.12.1996; USA-prior. 28.12.1995).
 DE 19 604 101 (B. Lehmann; 6.2.1996).
 EP 806 425 (Lupin Lab.; EP-prior. 9.4.1996).
 US 5 792 868 (Ajinomoto; appl. 18.3.1994; J-prior. 18.9.1991).

Formulation(s): cps. 200 mg; cream 50 mg/g; eye ointment 30 mg/g; susp. 8 %; tabl. 200 mg, 400 mg, 800 mg;
 vial 250 mg, 500 mg

Trade Name(s):

D:	Zovirax (Glaxo Wellcome; 1983)	Alovir (Foletto) Avirase (Lampugnani)	Sifiviral (SIFI) Zovirax (Wellcome; 1984)
F:	Activir (Warner-Lambert) Zovirax (Wellcome; 1983)	Avyclor (Bioprogress) Cycloviran (Sigma-Tau)	J: Zovirax (Seimitomo-Wellcome; 1985)
GB:	Herpetad (Boehringer Ing.) Zovirax (Glaxo Wellcome; 1981)	Dravyr (Drug Research) Efrivir (Aesculapius-Bs) Esavir (Boniscontro & Gazzone)	USA: Zovirax (Glaxo Wellcome; 1985)
I:	Aciviran (Ripari-Gero) Acyvir (Delalande Isnardi)	Neviran (Coli)	

Acipimox

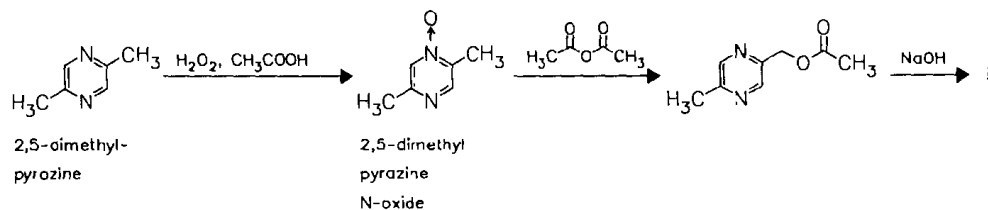
ATC: C10AD06

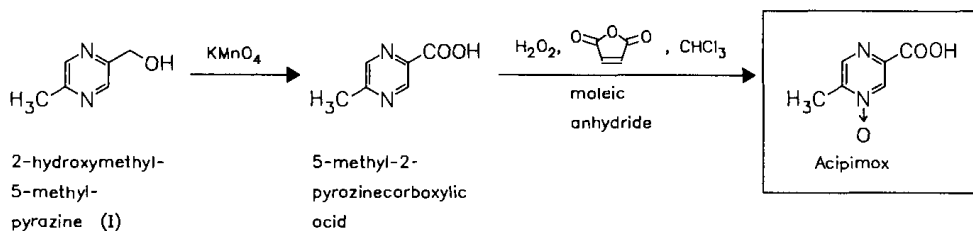
Use: antihyperlipoproteinemic

RN: 51037-30-0 MF: C₆H₆N₂O₃ MW: 154.13 EINECS: 256-928-3

LD₅₀: 3500 mg/kg (M, p.o.)

CN: 5-methylpyrazinecarboxylic acid 4-oxide



**Reference(s):**

US 4 002 750 (Carlo Erba; 11.1.1977; I-prior. 28.4.1972).
 US 4 051 245 (Carlo Erba; 27.9.1977; I-prior. 28.4.1972).
 DOS 2 319 834 (Carlo Erba; appl. 18.4.1973; I-prior. 28.4.1972).
 GB 1 361 967 (Carlo Erba; appl. 12.4.1973; I-prior. 28.4.1972).
 Brubrog, V. et al.: Eur. J. Med. Chem. (EJMCA5) **15**, 157 (1980).

5-methyl-2-pyrazinecarboxylic acid:

Pitré, D. et al.: Chem. Ber. (CHBEAM) **99**, 364 (1966).

2-hydroxymethyl-5-methylpyrazine:

Klein, B. et al.: J. Org. Chem. (JOCEAH) **26**, 129 (1961).

Formulation(s): cps. 25 mg, 250 mg

Trade Name(s):

I: Olbetam (Pharmacia & Upjohn; 1985)

Aclarubicin

(Aclacinomycin A)

ATC: L01DB04

Use: antineoplastic

RN: 57576-44-0 MF: C₄₂H₅₃NO₁₅ MW: 811.88 EINECS: 260-824-3

LD₅₀: 22.6 mg/kg (M, i.p.); 33.7 mg/kg (M, i.v.)

CN: [1R-(1 α ,2 β ,4 β)]-2-ethyl-1,2,3,4,6,11-hexahydro-2,5,7-trihydroxy-6,11-dioxo-4-[[2,3,6-trideoxy-4-O-[2,6-dideoxy-4-O-[(2R-trans)-tetrahydro-6-methyl-5-oxo-2H-pyran-2-yl]- α -1-lyxo-hexopyranosyl]-3-(dimethylamino)- α -1-lyxo-hexopyranosyl]oxy]-1-naphthacenicarboxylic acid methyl ester

hydrochloride

RN: 75443-99-1 MF: C₄₂H₅₃NO₁₅ · HCl MW: 848.34

