
# Martindale

## Thirty-sixth edition

# THE COMPLETE DRUG REFERENCE

# Martindale

## The Complete Drug Reference

**Thirty-sixth edition**

Edited by

**Sean C Sweetman**

BPharm, FRPharmS

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# Martindale: The Complete Drug Reference


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# Preface

The aim of Martindale is to provide healthcare professionals with unbiased evaluated information on drugs and medicines used throughout the world. It therefore has to develop as the body of knowledge on existing drugs grows, new drugs emerge, new preparations are launched, and old preparations are abandoned, reformulated, or redefined. It also has to reflect the changing needs of those practising pharmacy and medicine. We try to ensure that each new edition continues to meet all these needs.

In order to provide more up-to-date information the interval between the publication of the printed versions of Martindale has been reduced over successive editions and the book is now produced about every 2 years. For those who require even more up-to-date information from Martindale there are various electronic versions, sections of which are updated more frequently.

The year 2008 saw the publication of the third Spanish edition of Martindale, the translation having again been undertaken by our colleagues at Grupo Ars XXI, and also saw the appearance of the first edition of a Chinese language version of Martindale.

Martindale has been continuously expanded since it was first published in 1883, and to present all the extra information this edition of Martindale maintains the recent return to a two-volume publication. The first volume contains this preface and the drug monographs, and the second holds the proprietary preparations and the index, as well as manufacturers' contact information.

As always the contents have been extensively revised, with all the text scanned and revalidated where necessary by a team of experienced pharmacists. Over 260 monographs have been added, and 89 removed from the book (abbreviated information on the latter remains available in the electronic versions). In our continuing attempts to improve the clinical relevance of the book, the chapters on Prostaglandins and Hypothalamic and Pituitary Hormones have been split up and most of their contents added to new chapters on Obstetric Drugs and Growth Hormone and its Modulators. The chapter on Sex Hormones has been reorganised and renamed Sex Hormones and their Modulators.

The disease treatment reviews, 668 in all and generally located in the chapter introductions, have also been revised in order to reflect current trends and provide key references. Cross-references to these reviews appear in the monographs of the drugs cited; the reviews can also be accessed via the general index. It is hoped that these reviews will be of use to readers who want an overview of a particular disease and its drug treatment and will provide a useful starting point for those who want to pursue particular aspects further.

Martindale contains much nomenclature information intended to assist the reader in identifying a particular drug or compound, and for this edition we have again greatly expanded our coverage of synonyms, with the addition of names from Poland and Turkey, and increased coverage of Russian synonyms and 'street names' for substances of abuse. Coverage of ATC codes has been expanded to include codes assigned to veterinary medicines

This edition of Martindale also sees the number of graphical representations of the chemical structures increased.

The information on proprietary preparations, an important feature of Martindale, has been updated and more countries have been covered for this edition.

Martindale is based on published information and more than 47 700 selected references are included. The amount of drug information now published electronically has increased significantly since the last printed edition of Martindale and this edition now includes nearly 2700 citations to material available on the Internet as web pages. Because of the nature of the Internet, there is no way to guarantee that the material referred to by a URL will remain at that location, as many sites are subject to periodic reorganisation; additionally, the content of Internet documents may change without warning. All URLs in Martindale are rechecked shortly before publication to ensure that a document is present. The accession date given in the citation represents the last date on which the content of the document referred to was revalidated.

Our objective is to evaluate the literature, covering important studies, guidelines, and useful reviews and placing them in context. Multicentre studies, meta-analyses, and systematic reviews play an important role in the study of drug treatment, and their findings and conclusions are considered in many of our chapters. However, there is also a place for the anecdotal report and the small study, and information from such sources is included where appropriate. In compiling the text of a Martindale monograph extensive use is made of the drug's licensed product information as published in various countries and approved by the relevant regulatory health bodies. Acknowledgement is also given to information referenced from a number of authoritative sources including the *British National Formulary*, the *British National Formulary for Children*, the *British Pharmacopoeia*, the *European Pharmacopoeia*, the *United States National Formulary*, and the *United States Pharmacopeia*.

Martindale is not a book of standards. Inclusion of a substance or a preparation is not to be considered as a recommendation for use, nor does it confer any status on the substance or preparation. While considerable efforts have been made to check the material in Martindale, the publisher cannot accept any responsibility for errors and omissions. Also the reader is assumed to possess the necessary knowledge to interpret the information that Martindale provides.

## Philosophy and methodology

Martindale's uses are as varied as its users. However, our primary aims are:

- to summarise clinically useful information on all drugs and medicines around the world
- to provide accurate, unbiased, reasonably comprehensive, and regularly re-evaluated information in a concise format
- to provide a lead-in to the published evidence base from which we derive our information

In order to achieve the aims specified above, our working practices have to optimise internal knowledge management.

MARTINDALE STAFF. Martindale is currently produced by a team of 21 people, 18 of whom are pharmacists or pharmacy technicians with relevant expertise. The team is divided into 5 revising groups each of 2 staff editors, as well as 5 assistant editors, 1 editor-in-chief, a co-ordinator for the processing of information on proprietary medicines, and 4 clerical and support staff. A number of pharmacists work as external evaluators to maintain coverage of non-UK preparations.

Staff editors receive formal training in literature evaluation and searching techniques, as well as specific, 'on-the-job' training in internal procedures. Each revision team has responsibility for the re-evaluation and update of a particular group of chapters. Senior editorial staff edit and approve the output of the teams. Staff are responsible for ongoing data collection as well as the revision process.

DATA COLLECTION. In order to reduce the amount of formal data collection required at revision, a prospective data-collection roster is in operation. This involves all staff members in hand-searching selected major medical journals, as well as regular searches of the internet sites of regulatory authorities (EMEA, FDA, and MHRA), and sources of high-quality systematic reviews and guidelines (such as Bandolier, Clinical Evidence, Cochrane, and NICE), for drug information. In addition, pharmacopoeial, governmental and WHO publications are hand-searched for information relating to drugs and drug therapy.

The list of sources used has been iteratively developed over many years by analysis of previous citations, and is reviewed and updated regularly.

PROPRIETARY PREPARATIONS. The Martindale proprietary preparations team evaluate licensed product information for 40 countries and regions, in order to maintain the widest possible coverage of drugs in use internationally. Preparation names, manufacturers, ingredients, and licensed uses are included in the internal Martindale database for review during the revision process, and any significant additional information is forwarded to the relevant revision team.

REVISION. In order to maintain the quality and currency of our content, it is constantly revised and updated. Our revision processes cover both scheduled, in-depth revision of the content of every chapter in the book on a chapter-by-chapter basis, and updates in reaction to new information as it arrives. The revision procedure involves the formalised re-evaluation of all standing information, the assessment of new collected references for quality and relevance, and the selective use of search techniques on bibliographic databases and the Internet to identify further candidate information.

CHECKING. Once the material for a given chapter has been re-evaluated and updated it undergoes a rigorous check, designed to ensure not only that all changes are valid and appropriate, but also that important points have not been missed.

EDITING. The chapter is then passed to a member of the senior editorial staff, who performs a second check and preliminary editing of the data. This process is designed to ensure consistency of approach and style, as well as offering an opportunity to pick up any errors missed at the first check. Changes and questions are fed back to the revision team in an iterative process that may involve more than one cycle. Once past its preliminary edit the chapter is sent to the Editor for a final check and approval, which again may require changes to be made and checked, before passing it to the next stage.

KEYING, PROOF-READING, AND DOSE-CHECKING. Once approved by the Editor, amendments can be incorporated into the database, which remains untouched until this stage as a security measure. These changes are then proofread for errors, corrected if necessary, and any corrections checked. Extensive electronic testing for spelling, style, and format is also carried out at all stages. The amended chapter then undergoes an independent check of the dose information against its recorded sources. This check is performed by a member of staff outside the original revising and editing team, and is an additional safeguard against the inadvertent introduction of potentially dangerous dose errors. Once past these stages the data are cleared for release, and can be published in the next update of the Martindale electronic products, and, at appropriate points in the publishing cycle, in the book.

ADDITIONAL CHECKS FOR PUBLICATION. Some additional checks are made before publishing a print edition of Martindale. An second independent dose check of all chapters is made by an external expert, all cross-references are revalidated, and tests of the typesetting and page structure are made. In addition our extensive index is generated and carefully checked for accuracy, order, and consistency.

FEEDBACK. We are always grateful to get feedback from our users and, whenever possible, we try to incorporate information or suggestions that help us to improve Martindale. Anyone wishing to comment on the editorial content of Martindale can contact us at the following e-mail address: martindale@rpsgb.org

## Arrangement

VOLUME 1: • MONOGRAPHS ON DUGS AND ANCILLARY SUBSTANCES (pages 1–2418). This section contains 5827 monographs arranged in 54 chapters. These chapters generally bring together monographs on drugs and groups of drugs that have similar uses or actions. The introductions of those chapters that describe drugs used in the management of disease may contain disease treatment reviews—descriptions of those diseases together with reviews of the choice of treatments.The last chapter in this section consists of a series of monographs arranged in the alphabetical order of their main titles. It includes monographs on drugs not easily classified, on herbals, and on drugs no longer used clinically but still of interest. There are also monographs on toxic substances, the effects of which may require drug therapy.

VOLUME 2: • PREPARATIONS (pages 2191–2880). This section contains over 146 000 proprietary preparations from a range of countries and regions. For this edition we have covered Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, Czech Republic, Denmark, Finland, France, Germany, Greece, Hong Kong, Hungary, India, Indonesia, Ireland, Israel, Italy, Malaysia, Mexico, the Netherlands, New Zealand, Norway, Philippines, Poland, Portugal, Russia, Singapore, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, the United Arab Emirates, UK, USA, and Venezuela. We have also included some proprietary preparations from Japan. The information provided includes the proprietary name, the manufacturer or distributor, the active ingredients with cross-references to the drug monographs, and a summary of the indications as given by the manufacturer.

• DIRECTORY OF MANUFACTURERS (pages 3205–3274). In Martindale the names of manufacturers and distributors are abbreviated. Their full names are given in this directory together with the full address and website if it is available. This directory contains nearly 13 000 entries.

• GENERAL INDEX (pages 3275–3694). To make fullest use of the contents of Martindale the general index should always be consulted. The exhaustive index, prepared from 153 000 entries, includes entries for drugs (approved names, synonyms, and chemical names), preparations, pharmacological and therapeutic groups, and clinical uses (disease treatment reviews). As in previous editions, the index is arranged alphabetically 'word-by-word' rather than 'letter-by-letter'. The index indicates the column in which the relevant entry appears as well as the page. To improve clarity and the ease of location of index entries long chemical names have been omitted from the index.

This edition includes both nonproprietary and proprietary names in Russian, and these names may be found in Russian alphabetical order in the Cyrillic section of the index immediately following the entries in the Latin alphabet.

## Nomenclature

TITLES AND SYNONYMS. The title of each monograph is in English, with preference usually being given to International Nonproprietary Names (INN), British Approved Names (BAN), and United States Adopted Names (USAN). These 3 authorities are shown where appropriate. A European Directive (92/27/EEC) requires the use of Recommended International Nonproprietary Names (rINNs) in the labelling of medicinal products throughout member states of the European Community and where the BAN and INN differed in the past the BAN has been changed to accord with the rINN. The major exception to this convention is the retention of the names adrenaline and noradrenaline, these being the terms used as the titles of the monographs in the European Pharmacopoeia and therefore the official names in the member states. In some approved names it is now general policy to use 'f' for 'ph' in sulpha, 't' for 'th', and 'i' for 'y'; for this reason entries in alphabetical lists and indexes should be sought in alternative spellings if the expected spellings are not found. Inevitably there may be some inconsistencies of style with older approved names but wherever possible the names used for drugs or radicals in Martindale have been altered in accordance with the guidelines on the use of INNs for pharmaceutical substances. A table of contracted names for ions and groups used in approved names and titles is given on page xi. INNs in the four other main official languages (French, Latin, Russian, and Spanish) have also been included in the list of synonyms where these differ from the English INN. BAN names for substance combinations and United States Pharmacy Equivalent Names (PEN) for dosage forms containing two or more active ingredients are given in the text of the relevant monographs; these names start with the prefix 'Co-'.

This section also includes names given as synonyms such as commonly used abbreviated names; Latin versions of the titles in the European Pharmacopoeia; English, American, and Latin synonyms; names used in other languages when these may not be readily identifiable; manufacturers' code numbers; and chemical names. Official titles and synonyms used in the British, European, and US Pharmacopoeias are given in the section on pharmacopoeias where the relevant pharmacopoeial substance is described.

STREET NAMES. This edition of Martindale once again includes greatly expanded coverage of 'street names' for substances of abuse. Street terms and other slang names for drugs of abuse are included for guidance only and should be used with caution. Because of the very nature of their origin they cannot be relied upon for definitive identification of a substance. The use of such terms changes rapidly, and can vary between different geographical locations, and any given name may potentially be applied to more than one substance or even to a mixture of substances. Furthermore, established or well recognised generic drug names or herbal names have sometimes been misused as street terms for completely unrelated substances. In order to enable the reader to distinguish them from better validated synonyms, in the index, such names are included in italics and in quotation marks.

CAS REGISTRY NUMBERS. Chemical Abstracts Service (CAS) registry numbers are provided, where available, for each monograph substance to help readers refer to other information systems. Numbers for various forms of the monograph substance are listed with the variation in form given in parentheses.

ATC CODES. Codes from the Anatomical Therapeutic Chemical (ATC) classification system (see http://www.whocc.no) have been provided, where available, for each monograph substance to help readers refer to other information systems. The codes assigned in the equivalent classification system for veterinary medicines (ATC Vet—see http://www.whocc.no/atcvet) have been included where possible.

## Atomic and Molecular Weights

Atomic weights are based on the table of Atomic Weights as revised in 2007 by the Commission on Atomic Weights and Isotopic Abundance, International Union of Pure and Applied Chemistry (IUPAC) and based on the $^{12}C$ scale (see page xiii). Molecular weights are given corrected to one place of decimals or to four significant figures for relative weights of less than 100.

## Pharmacopoeias

The selected pharmacopoeias in which each substance appears are listed. A description of the substance and a summary of the pharmaceutical information (see below) that appears in the British, European, or US Pharmacopoeias is also included. Current copies of the pharmacopoeias and their addenda should be consulted for confirmation and for details of standards.

The pharmacopoeias covered include: *British*, *British Veterinary*, *Chinese*, *European*, *French*, *German*, *International*, *Italian*, *Japanese*, *Polish*, *Spanish*, *Swiss*, *United States* (including the *National Formulary*), and *Vietnamese*. The abbreviations for these pharmacopoeias are included in the list of abbreviations

used in Martindale, see page viii, which also includes details of the edition and/or supplement(s) consulted.

Several countries are parties to the Convention on the Elaboration of a European Pharmacopoeia. This means that they must adopt the standards of the European Pharmacopoeia. These countries are currently Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Montenegro, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the Former Yugoslav Republic of Macedonia. Hence the European Pharmacopoeia is cited in the drug monograph lists of pharmacopoeias rather than these individual national pharmacopoeias.

Official preparations, mainly from the current British, European, and US Pharmacopoeias, are listed at the end of drug monographs.

## Pharmaceutical Information

Information on the chemical and physical properties of each substance is given when it is likely to be of use or interest, but only when it is certain that it applies to the form of substance being described in the monograph.

PERCENTAGE STRENGTHS. Unless otherwise stated, solutions of solids in liquids are expressed as percentage w/v, of liquids in liquids as percentage v/v, and of gases in liquids as percentage w/w.

SOLUBILITY. The figures given for solubility in each monograph have generally been obtained from the major pharmacopoeias in which the substance is described, but should not be considered absolute. Unless otherwise indicated in the text, the figures are for solubility at temperatures between 15° and 25°. The information usually relates to w/v solubilities but in some cases is v/v if the monograph substance itself is a liquid. Where solubilities are given in words, the following terms describe the indicated solubility ranges:

| **solubility** | |
|---|---|
| very soluble | 1 in less than 1 |
| freely soluble | 1 in 1 to 1 in 10 |
| soluble | 1 in 10 to 1 in 30 |
| sparingly soluble | 1 in 30 to 1 in 100 |
| slightly soluble | 1 in 100 to 1 in 1000 |
| very slightly soluble | 1 in 1000 to 1 in 10 000 |
| practically insoluble | 1 in more than 10 000 |

STORAGE. Substances and preparations should be stored under conditions which prevent contamination and diminish deterioration, and the conditions of storage given in the text indicate the precautions recommended in specific cases. The term ‘a cool place’ is generally used to describe a place in which the temperature is between 8° and 15°. In general, the storage conditions apply to the monograph substance and not its solutions or preparations.

TEMPERATURE. Temperatures are expressed in degrees Celsius (centigrade) unless otherwise indicated.

## Drugs in Sport

Wherever possible we have attempted to indicate those drugs and substances that may be subject to restriction in some or all sports, either in their own right, or because they are a derivative of a restricted substance or a member of a prohibited group. Proprietary preparations containing such compounds are also marked in the preparation section in Volume 2. The definitive guide used for identifying restricted drugs for this edition is the 2008 Prohibited List issued by the World Anti-Doping Agency (WADA—see www.wada-ama.org). However, these regulations, which are issued annually, are subject to interpretation and therapeutic exemption, and may vary from sport to sport; particular sporting authorities may also issue additional restrictions, and competitors should always check with the appropriate body. The rules are constantly evolving and the absence of any indication of restriction in Martindale should not be taken as absolute confirmation that the substance may legitimately be taken by a competitor.

## Pharmacological and Therapeutic Information

Information on adverse effects, treatment of adverse effects, precautions (including contra-indications), interactions, pharmacokinetics, and uses and administration of each substance is provided by concise statements and these may be elaborated and expanded by referenced reviews and abstracts from papers and other publications. This edition contains about 15 000 such abstracts or reviews based on information in an ever widening range of publications.

Much information has been found in sources such as World Health Organization publications, government reports and legislation, and other official and standard publications. Licensed product information and manufacturers' literature has been considered in the light of other available information.

The risks of giving drugs in pregnancy are well known and the general principle is to give a drug only when the benefit to the individual mother outweighs the risk to the fetus. Where there is a clear risk it is noted under the Precautions or Adverse Effects heading but safety should not be inferred from the absence of a statement for any drug.

Some drugs given to the mother are distributed into breast milk and therefore may pose a risk to a breast-fed infant. Whenever possible, information has been included to help determine the safety of continuing to breast feed while the mother is receiving a particular drug. Safety during breast feeding should not be inferred from the absence of a statement for any drug.

## Doses

Doses are described under the Uses and Administration heading with as much detail as is necessary and available. Unless otherwise stated the doses represent the average range of quantities which are generally regarded as suitable for adults when given by mouth. More information on doses and drug administration may be given in the abstracts or reviews. Unless otherwise specified, glucose injection is 5% w/v and sodium chloride injection is 0.9% w/v.

When doses for children are expressed as a range of quantities within specified age limits, the lower dose applies at the lower age and the higher dose at the higher age.

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Martindale staff have been able to call on the expertise of other members of the Royal Pharmaceutical Society's staff. In particular the Editor is grateful to J Martin and the staff of the British National Formulary, and the staff of the library and information department. Thanks are due to I Baxter, M Davis, S Driver, EJ Laughton, R McLarney, and SJ Shankie for their editorial tasks. Thanks are also due to PJ Weller, C Fry and the staff of the Pharmaceutical Press for their support.

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London October 2008

# Abbreviations

For abbreviations of the names of manufacturers or their distributors, see Directory of Manufacturers, page 3205.

**ACE**—angiotensin-converting enzyme.
**ADHD**—attention deficit hyperactivity disorder.
**agg.**—aggregate (in botanical names), including 2 or more species which resemble each other closely.
**AIDS**—acquired immunodeficiency syndrome.
**a.m.**—*ante meridiem*, 'before noon'.
**ARC**—AIDS-related complex.
***Arg.***—Argentina.
**ATC**—Anatomical Therapeutic Chemical classification.
**AUC**—area under the concentration-time curve.
***Austral.***—Australia.
**AV**—atrioventricular.
**BAN**—British Approved Name.
**BANM**—British Approved Name Modified.
***Belg.***—Belgium.
**BMA**—British Medical Association.
**BMI**—body mass index.
**BNF**—British National Formulary.
**BNFC**—British National Formulary for Children.
**b.p.**—boiling point.
**BP**—British Pharmacopoeia. Unless otherwise specified, BP references are to the 2008 edition.
**BP(Vet)**—British Pharmacopoeia (Veterinary) 2008.
**BPC**—British Pharmaceutical Codex.
***Br.***—British.
***Braz.***—Brazil.
***Bulg.***—Bulgaria.
**BUN**—Blood-urea-nitrogen.
°**C**—degrees Celsius (centigrade). Unless otherwise indicated in the text, temperatures are expressed in this thermometric scale.
***Canad.***—Canada.
**CAPD**—continuous ambulatory peritoneal dialysis.
***CAS***—Chemical Abstracts Service.
**CCPD**—continuous cycle peritoneal dialysis.
**CDC**—Centers for Disease Control and Prevention (USA) (formerly Centers for Disease Control).
***Chin. P.***—Chinese Pharmacopoeia 2005.
**CHM**—Commission on Human Medicines (UK).
**CI**—Colour Index.
**CMV**—cytomegalovirus.
**CNS**—central nervous system.
**cP**—centipoise(s).
**CPMP**—Committee on Proprietary Medicinal Products of the European Union.
**CSF**—cerebrospinal fluid.
**CSM**—Committee on Safety of Medicines (UK) (now subsumed within the Commission on Human Medicines).
**cSt**—centistokes.
***Cz.***—Czech Republic.
**D & C**—designation applied in USA to dyes permitted for use in drugs and cosmetics.
**d.c.**—direct current.
**DEFRA**—Department for Environment, Food, and Rural Affairs (UK).
***Denm.***—Denmark.
**DHSS**—the former Department of Health and Social Security (UK).
**dL**—decilitre(s).
**DNA**—deoxyribonucleic acid.
**DoH**—Department of Health (UK).
**DTF**—Drug Tariff Formulary.
**ECG**—electrocardiogram.
**ECT**—electroconvulsive therapy.
***Ecuad.***—Ecuador.
**ed.**—editor(s) *or* edited by *or* edition.
**EEC**—European Economic Community, now the European Union.
**EEG**—electro-encephalogram.
**e.g.**—*exempli gratia* 'for example'.
**EMEA**—European Medicines Agency.
**ENL**—erythema nodosum leprosum.
**ESRD**—end-stage renal disease.
***et al.***—*et alii*, 'and others': for three or more co-authors or co-workers.
***et seq.***—and what follows.
***EU***—European Union.
***Eur. P.***—see Ph. Eur.
**Ext. D & C**—designation applied in USA to dyes permitted for use in external drug and cosmetic preparations.
°**F**—degrees Fahrenheit.
**FAC**—Food Additives and Contaminants Committee of the former Ministry of Agriculture, Fisheries and Food (UK).
**FAO**—Food and Agriculture Organization of the United Nations.
**FAO/WHO**—Food and Agriculture Organization of the United Nations *and the* World Health Organization.
**FDA**—Food and Drug Administration of USA.
**FdAC**—Food Advisory Committee of the former Ministry of Agriculture, Fisheries and Food (UK).
**FD & C**—designation applied in USA to dyes permitted for use in foods, drugs, and cosmetics.
$\mathbf{FEV_1}$—forced expiratory volume in 1 second.
***Fin.***—Finland.
**FIP**—Fédération Internationale Pharmaceutique.
**f.p.**—freezing point.
**FPA**—Family Planning Association (UK).
***Fr.***—France.
***Fr. P.***—French Pharmacopoeia 1982 (Pharmacopée Francaise, $X^e$ Edition) and updates up to 2003.
**g**—gram(s).
***Ger.***—Germany.
***Ger. P.***— German Pharmacopoeia (Deutsches Arzneibuch, 2007).
**GFR**—glomerular filtration rate.
**G6PD**—glucose-6-phosphate dehydrogenase.
***Gr.***—Greece.
**HAART**—highly active antiretroviral therapy.
**Hb**— haemoglobin.
**Hib**—*Haemophilus influenzae* type b.
**HIV**—human immunodeficiency virus.
**HLA**—human lymphocyte antigens.
**HLB**—hydrophilic-lipophilic balance.

**HRT**—hormone replacement therapy.
**HSE**—Health and Safety Executive (UK).
***Hung.***—Hungary.
**IARC**—International Agency for Research on Cancer.
***ibid.***—*ibidem*, 'in the same place (journal or book)'.
***idem***—'the same': used for the same authors and titles.
**i.e.**—*id est*, 'that is'.
**Ig**—immunoglobulin.
***Indon.***—Indonesia.
**INN**—International Nonproprietary Name.
**INNM**—International Nonproprietary Name Modified.
***Int. P.***—International Pharmacopoeia 4th ed., 2006.
**IPCS**—International Programme on Chemical Safety.
**IQ**—intelligence quotient.
***Irl.***—Ireland.
**ISH**—International Society of Hypertension.
***It. P.***—Italian Pharmacopoeia 11th ed., 2002 (Farmacopea Ufficiale della Repubblica Italiana, XI Edizione, 2002).
***Ital.***—Italy.
**IUD**—intra-uterine device.
**IUPAC**—International Union of Pure and Applied Chemistry.
**IVF**—*in-vitro* fertilisation.
**J**—joule(s).
***Jpn***—Japan.
***Jpn P.***—The Pharmacopoeia of Japan, 15th ed., 2006.
**K**—kelvin.
**kcal**—kilocalorie(s).
**kg**—kilogram(s).
**kJ**—kilojoule(s).
**lb**—pound(s) avoirdupois.
**LD50**—a dose lethal to 50% of the specified animals or micro-organisms.
**m**—metre(s).
**$m^2$**—square metre(s).
**$m^3$**—cubic metre(s).
**M**—molar.
**MAFF**—the former Ministry of Agriculture, Fisheries and Food (UK), now Department of Environment, Food, and Rural Affairs (DEFRA).
**MAOI**—monoamine oxidase inhibitor.
**max.**—maximum.
**MBC**—minimum bactericidal concentration.
**MCA**—Medicines Control Agency, now MHRA (UK).
**mEq**—milliequivalent(s).
***Mex.***—Mexico.
**mg**—milligram(s).
**MHRA**—Medicines and Healthcare products Regulatory Agency (UK).
**MIC**—minimum inhibitory concentration.
**min**—minute.
**min.**—minimum.
**MJ**—megajoule(s).
**mL**—millilitre(s).
**mm**—millimetre(s).
**$mm^2$**—square millimetre(s).
**$mm^3$**—cubic millimetre(s).
**mmHg**—millimetre(s) of mercury.
**mmol**—millimole.
**mol**—mole.
**mol. wt**—molecular weight.
***Mon.***—Monaco.
**mosmol**—milliosmole.
**m.p.**—melting point.
**MRC**—Medical Research Council (UK).
**MRSA**—meticillin-resistant *Staphylococcus aureus*.
**μg**—microgram(s).
**μm**—micrometre(s).
***Neth.***—The Netherlands.
**NICE**—National Institute for Health and Clinical Excellence (formerly the National Institute for Clinical Excellence) (UK).
**NIH**—National Institutes of Health (USA).
**nm**—nanometre(s).
**NMDA**—*N*-methyl-D-aspartate.
**NNRTI**—non-nucleoside reverse transcriptase inhibitor.
***Norw.***—Norway.
**NRTI**—nucleoside reverse transcriptase inhibitor.
**NSAID**—nonsteroidal anti-inflammatory drug.
**NYHA**—New York Heart Association.
***NZ***—New Zealand.
**OP**—over proof.
**o/w**—oil-in-water.
***P***—probability.
**Pa**—pascal(s).
**$pCO_2$**—plasma partial pressure (concentration) of carbon dioxide.
**$p_aCO_2$**—arterial plasma partial pressure (concentration) of carbon dioxide.
**PEN**—Pharmacy Equivalent Name, see page vi.
**pg**—picogram(s).
**pH**—the negative logarithm of the hydrogen ion concentration.
**Ph. Eur.**—European Pharmacopoeia, 6th ed., 2008 and Supplements 6.1 and 6.2.
***Pharm. Soc. Lab. Rep.***—Royal Pharmaceutical Society's Laboratory Report.
***Philipp.***—Philippines.
**PHLS**—Public Health Laboratory Service (UK).
**pINN**—Proposed International Nonproprietary Name.
**pINNM**—Proposed International Nonproprietary Name Modified.
**$pK_a$**—the negative logarithm of the dissociation constant.
**p.m.**—*post meridiem*, 'afternoon'.
**$pO_2$**—plasma partial pressure (concentration) of oxygen.
**$p_aO_2$**—arterial plasma partial pressure (concentration) of oxygen.
***Pol.***—Poland.
***Pol. P.***—Polish Pharmacopoeia 6th ed., 2002 (Farmakopea Polska VI, 2002) and Supplement 2005.
***Port.***—Portugal.
**ppm**—parts per million.
**PSGB**—The Pharmaceutical Society of Great Britain. Now the Royal Pharmaceutical Society of Great Britain.
**PUVA**—psoralen with UVA light irradiation.
**PVC**—polyvinyl chloride.
**RCGP**—Royal College of General Practitioners (UK).
**RIMA**—reversible inhibitor of monoamine oxidase type A.
**rINN**—Recommended International Nonproprietary Name.
**rINNM**—Recommended International Nonproprietary Name Modified.
**RNA**—ribonucleic acid.
**RPSGB**—The Royal Pharmaceutical Society of Great Britain.
**RSV**—respiratory syncytial virus.
***S. Afr.***—South Africa.
**SGOT**—serum glutamic oxaloacetic transaminase (serum aspartate aminotransferase *now preferred*).

**SGPT**—serum glutamic pyruvic transaminase (serum alanine aminotransferase *now preferred*).

**SI**—Statutory Instrument *or* Système International d'Unités (International System of Units).

***sic***—written exactly as it appears in the original.

**SLE**—systemic lupus erythematosus.

**sp.**—species (plural spp.).

**sp. gr.**—specific gravity.

***Span.***—Spanish.

***Span. P.***—Spanish Pharmacopoeia 2nd ed., 2002 (Real Farmacopoea Española, Segunda Edición, 2002) and Supplement 2.1.

**SSRI**—selective serotonin reuptake inhibitor.

***St***—stokes.

**subsp.**—subspecies.

**suppl**—supplement(s).

***Swed.***—Sweden.

***Swiss P.***—Swiss Pharmacopoeia 2006 (Pharmacopoea Helvetica, 10 Ausgabe, Deutsche Ausgabe).

***Switz.***—Switzerland.

***Thai.***—Thailand.

**TNF**—tumour necrosis factor.

**TPN**—total parenteral nutrition.

***Turk.***—Turkey.

***UAE***—United Arab Emirates.

***UK***—United Kingdom.

**UNICEF**—United Nations Children's Fund.

**UP**—under proof.

***Urug.***—Uruguay.

***US*** and ***USA***—United States of America.

**USAN**—United States Adopted Name.

**USNF**—The United States 'National Formulary 26', 2008, and Supplements 1 and 2.

**USP**—The United States Pharmacopeia 31, 2008, and Supplements 1 and 2.

**UV**—ultraviolet.

**var.**—variety.

***Venez.***—Venezuela.

***Viet.***—Vietnamese.

***Viet. P.***—Vietnamese Pharmacopoeia 2002 (Pharmacopoeia Vietnamica, Editio III).

**vol.**—volume(s).

**v/v**—volume in volume.

**v/w**—volume in weight.

**WHO**—World Health Organization.

**w/o**—water-in-oil.

**wt**—weight.

**wt per mL**—weight per millilitre.

**w/v**—weight in volume.

**w/w**—weight in weight.

# Contracted Names for Ions and Groups

| Contracted Name | Chemical Name |
|---|---|
| **acefurate** | acetate (ester) and furan-2-carboxylate (ester) |
| **aceglumate** | *rac*-hydrogen *N*-acetylglutmate |
| **aceponate** | acetate (ester) and propionate (ester) |
| **acetonide** | isopropylidenedioxy or propane-2,2-diylbis(oxy) |
| **aceturate** | *N*-acetylglycinate |
| **acibutate** | acetate (ester) and 2-methylpropanoate (ester) |
| **acistrate** | acetate (ester) and stearate (salt) |
| **acoxil** | acetoxymethyl or (acetyloxy)methyl |
| **alfoscerate** | (2*R*)-2,3-dihydroxypropyl hydrogen phosphate |
| **alideximer** | poly([oxy(2-hydroxyethane-1,1-diyl)]{oxy[1-(hydroxymethyl)ethane-1,2-diyl]}) partly *O*-etherified with carboxymethyl groups with some carboxy groups amide linked to the tetrapeptide residue (glyglyglycyl-L-phenylalanylglycyl) |
| **amsonate** | 4,4′-diaminostilbene-2,2′-disulfonate or 2,2′-ethene-1,2-diylbis(5-aminobenzene-1-sulfonate) |
| **anisatil** | 2-(4-methoxyphenyl)-2-oxoethyl or *p*-methoxyphenacyl |
| **arbamel** | 2-(dimethylamino)-2-oxoethyl or ester with *N*,*N*-dimethylglycolamide |
| **argine** | $30^{B}$α–L-argine-$30^{B}$β-L-argine |
| **aritox** | ricin A chain-MAB immunotoxine |
| **aspart** | $28^{B}$-L-aspartic acid- |
| **axetil** | (*RS*)-1-acetoxyethyl or *rac*-1-(acetyloxy)ethyl |
| **beloxil** | benzyloxy |
| **benetonide** | *N*-benzoyl-2-methyl-β-alanine (ester) and acetonide |
| **besilate (besylate)** | benzenesulfonate |
| **betadex** | β-cyclodextrin |
| **bezomil** | (benzoyloxy)methyl |
| **buciclate** | *trans*-4-butylcyclohexanecarboxylate |
| **bunapsilate** | 3,7-di-*tert*-butylnaphthalene-1,5-disulfonate |
| **buteprate** | butyrate (ester) and propionate (ester) |
| **camsilate (camsylate)** | camphor-10-sulfonate or (7,7-dimethyl-2-oxobicyclo[2.2.1]heptan-1-yl)methanesulfonate |
| **caproate** | hexanoate |
| **carbesilate** | 4-sulfobenzoate |
| **ciclotate (cyclotate)** | 4-methylbicyclo[2.2.2]oct-2-ene-1-carboxylate |
| **cilexetil** | (*RS*)-1-{[(cyclohexyloxy)carbonyl]oxy}ethyl or *rac*-1-{[(cyclohexyloxy)carbonyl]oxy}ethyl |
| **cipionate (cypionate)** | cyclopentanepropionate or 3-cyclopentylpropanoate |
| **cituxetan** | *rac*-*N*-(4-{2-[bis(carboxymethyl)amino]-3-({2-[bis(carboxymethyl)amino]ethyl}(carboxymethyl)amino)propyl}phenyl)thiocarbamoyl |
| **clofibrol** | 2-(4-chlorophenoxy)-2-methylpropyl |
| **closilate (closylate)** | 4-chlorobenzene-1-sulfonate |
| **crobefate** | *rac*-{3-[(3*E*)-4-methoxybenzylidene]-2-(4-methoxyphenyl)chroman-6-yl phosphate(2-)} |
| **cromacate** | 2-[(6-hydroxy-4-methyl-2-oxo-2*H*-chromen-7-yl)oxy]acetate |
| **cromesilate** | 6,7-dihydroxycoumarin-4-methanesulfonate or (6,7-dihydroxy-2-oxo-2*H*-chromen-4-yl)methanesulfonate |

| Contracted Name | Chemical Name |
|---|---|
| **crosfumaril** | (2*E*)-but-2-enedioyl |
| **cyclamate** | cyclohexylsulfamate |
| **daloxate** | L-alaninate (ester) and (5-methyl-2-oxo-1,3-dioxol-4-yl)methyl |
| **daropate (dapropate)** | *N*,*N*-dimethyl-β-alaninate or 3-(dimethylamino)propanoate |
| **deanil** | 2-(dimethylamino)ethyl |
| **decil** | decyl |
| **defalan** | des-$1^{B}$-L-phenylalanine-insulin |
| **detemir** | tetradecanoyl |
| **dibudinate** | 2,6-di-*tert*-butylnaphthalene-1,5-disulfonate |
| **dibunate** | 2,6-di-*tert*-butylnaphthalene-1-sulfonate |
| **dicibate** | dicyclohexylmethyl carbonate |
| **diftitox** | *N*-L-methionyl-387-L-histidine-388-L-alanine-1-388-toxin (*Corynebacterium diphtheriae* strain C7) (388→2′)-protein |
| **digolil** | 2-(2-hydroxyethoxy)ethyl |
| **diolamine** | 2,2′-azanediyldiethanol or diethanolamine |
| **docosil** | docosyl |
| **dofosfate** | octadecyl hydrogen phosphate |
| **ecamate** | *N*-ethylcarbamate |
| **edamine** | ethane-1,2-diamine or ethylenediamine |
| **edetate** | ethylenediamine-*NNN′N′*-tetra-acetate |
| **edisilate (edisylate)** | ethane-1,2-disulfonate |
| **embonate** | 4,4′-methylenebis(3-hydroxynaphthalene-2-carboxylate) or 4,4′-methylenebis(3-hydroxy-2-naphthoate) (=pamoate) |
| **enantate (enanthate)** | heptanoate |
| **enbutate** | acetate (ester) and butanoate (ester) |
| **epolamine** | 1-pyrrolidineethanol or 2-(pyrrolidin-1-yl)ethanol |
| **erbumine** | *tert*-butylamine or 2-methylpropan-2-amine |
| **esilate (esylate)** | ethanesulfonate |
| **estolate** | propanoate (ester) and dodecyl sulfate (salt) or propionate dodecyl sulfate |
| **etabonate** | (ethoxycarbonyl)oxy (=ethyl carbonate) |
| **etilsulfate** | ethyl sulfate |
| **farnesil** | (2*E*,6*E*)-3,7,11-trimethyldodeca-2,6,10-trien-1-yl |
| **fendizoate** | 2-(6-hydroxybiphenyl-3-carbonyl)benzoate |
| **fostedate** | tetradecyl hydrogen phosphate |
| **furetonide** | 1-benzofurane-2-carboxylate (ester) and propane-2,2-diylbis(oxy) |
| **gamolenate** | (6*Z*,9*Z*,12*Z*)-octadeca-6,9,12-trienoate |
| **glargine** | $21^{A}$-glycine-$30^{B}$α-L-arginine-$30^{B}$β-L-arginine |
| **gluceptate** | D-*glycero*-D-*gulo*-heptanoate or D-*glycero*-D-*gulo*-heptonate |
| **glulisine** | [$3^{B}$-L-lysine,$29^{B}$-L-glutamic acid] |
| **glutamer** | glutaraldehyde polymer |
| **guacil** | 2-methoxyphenyl |
| **hemisuccinate** | hydrogen butanedioate |

| Contracted Name | Chemical Name |
|---|---|
| **hexacetonide** | 3,3-dimethylbutanoate (ester) and propan-2,2-diylbis(oxy) or 3,3-dimethylbutyrate (ester) and acetonide |
| **hibenzate (hybenzate)** | 2-(4-hydroxybenzoyl)benzoate |
| **hyclate** | monohydrochloride hemi-ethanolate hemihydrate |
| **hydroxynaphtoate** | 3-hydroxynapthalene-2-carboxylate |
| **isetionate (isethionate)** | 2-hydroxyethane-1-sulfonate |
| **laurate** | dodecanoate |
| **lauril** | dodecyl |
| **laurilsulfate (lauryl sulphate)** | dodecyl sulfate |
| **lisetil** | L-lysinate (ester) and diethyl (ester) |
| **lisicol** | {*N*-[(5*S*)-5-carboxy-5-(3α,7α,12α-trihydroxy-5β-cholan-24-amido)pentyl]carbamothioyl}amino |
| **lispro** | $28^{B}$-L-lysine-$29^{B}$-L-proline |
| **mafenatox** | enterotoxin A (227-alanine) (*Staphylococcus aureus*) |
| **medoxomil** | (5-methyl-2-oxo-1,3-dioxol-4-yl)methyl |
| **megallate** | 3,4,5-trimethoxybenzoate |
| **meglumine** | *N*-methylglucamine |
| **merpentan** | 4,5-bis(2-mercaptoacetamido) valeric acid or {*N*,*N*′-[1-(3-oxopropyl)ethane-1,2-diyl]bis(2-sulfanylacetamidato)}(4-) |
| **mertansine** | tetrakis{(4*RS*)-4[(3-{[(1*S*)-2-{[(1*S*,2*R*,3*S*,5*S*,6*S*,16*E*,18*E*,20*R*,21*S*)-11-chloro-21-hydroxy-12,20-dimethoxy-2,5,9,16-tetramethyl-8,23-dioxo-4,24-dioxa-9,22-diazatetracyclo[19.3.1.1$^{10,14}$.0$^{3,5}$]hexacosa-10,12,14(26),16,18-pentaen-6-yl]oxy}-1-methyl-oxoethyl]methylamino}-3-oxopropyl)disulfanyl]pentanoyl} |
| **mesilate (mesylate)** | methanesulfonate |
| **metembonate** | 4,4′-methylenebis(3-methoxynaphthalene-2-carboxylate) |
| **methonitrate** | *N*-methyl, nitrate (salt) |
| **metilsulfate** | methyl sulfate |
| **metiodide** | *N*-methyl, iodide (salt) |
| **methylbromide** | *N*-methyl, bromide (salt) |
| **mofetil** | 2-(morpholino)ethyl or 2-(morpholin-4-yl)ethyl |
| **napadisilate** | naphthalene-1,5-disulfonate |
| **napsilate (napsylate)** | naphthalene-2-sulfonate |
| **nicotinate** | pyridine-3-carboxylate |
| **octil** | octyl |
| **olamine** | 2-aminoethanol or ethanolamine |
| **oleate** | (9*Z*)-octadec-9-enoate |
| **oxoglurate** | hydrogen 2-oxopentanedioate |
| **palmitate** | hexadecanoate |
| **pamoate** | 4,4′-methylenebis(3-hydroxy-2-naphthoate) (=embonate) |
| **pegol** | α-(2-carboxyethyl)-ω-methoxypoly(oxyethane-1,2-diyl) |
| **pendetide** | $N^{6}$-{*N*-[2-({2-[bis(carboxymethyl)amino]-ethyl}(carboxymethyl)amino)ethyl]-*N*-(carboxymethyl)glycyl}-$N^{2}$-(*N*-glycyl-L-tyrosyl)-L-lysine |
| **pentexil** | (*RS*)-1-[(2,2-dimethylpropanoyl)oxy]ethyl |
| **phenpropionate** | 3-phenylpropionate |
| **pivalate** | 2,2-dimethylpropanoate (ester) or trimethylacetate |
| **pivoxetil** | *rac*-1-[(2-methoxy-2-methylpropanoyl)oxy]ethyl or 1-(2-methoxy-2-methylpropionyloxy)ethyl |
| **pivoxil** | (2,2-dimethyl-1-oxopropoxy)methyl or [(2,2-dimethylpropanoyl)oxy]methyl or (pivaloyloxy)methyl |
| **poliglumex** | [poly(L-glutamic acid)$_z$—(L-glutamate-γ-ester)—poly(L-glutamic acid)$_y$]$_n$ |
| **probutate** | 17-(1-oxobutoxy) (ester) and 21-(1-oxopropoxy) (ester) or propionate (ester) and butyrate (ester) |
| **proxetil** | 1-[(isopropoxycarbonyl)oxy]ethyl or *rac*-1-{[(propan-2-yloxy)carbonyl]oxy}ethyl |
| **raffimer** | (2*S*,4*R*,6*R*,8*S*,11*S*,13*S*)-2,4,8,13-tetrakis(hydroxymethyl)-4,6,11-tris(ylomethyl)-3,5,7,10,12-pentaoxatetradecane-1,14-diyl |
| **salicylate** | 2-hydroxybenzoate |
| **sesquioleate** | (9*Z*)-octadec-9-enoate(1.5) |
| **soproxil** | {[(propan-2-yloxy)carbonyl]oxy}methyl |
| **steaglate** | 2-(octadecanoyloxy)acetate (ester) |
| **stearate** | octadecanoate |
| **stinoprate** | *N*-acetylcysteinate (salt) and propanoate (ester) |
| **succinil** | 3-carboxypropanoyl |
| **sudotox** | 248-L-histidine-249-L-methionine-250-L-alanine-251-L-glutamic acid-248-613-endotoxin A (*Pseudomonas aeruginosa* reduced) |
| **suleptanate** | monosodium 8-[methyl(2-sulfoethyl)amino]-8-oxooctanoate or monosodium 7-[methyl(2-sulfonatomethyl)carbamoyl]heptanoyl |
| **sulfoxylate** | sulfinomethyl, monosodium salt |
| **tafenatox** | enterotoxin A (*Staphylococcus aureus*) |
| **tartrate** | (2*R*,3*R*)-2,3-dihydroxybutanedioate |
| **tebutate** | *tert*-butylacetate or 3,3-dimethylbutyrate |
| **tenoate** | thiophene-2-carboxylate |
| **teoclate** | 8-chloro-1,3-dimethyl-2,6-dioxo-3,6-dihydro-1*H*-purin-7-(2*H*)-ide or 8-chlorotheophyllinate |
| **teprosilate** | 3-(1,3-dimethyl-2,6-dioxo-1,2,3,6-tetrahydro-7*H*-purin-7-yl)propane-1-sulfonate |
| **tidoxil** | *rac*-2-(decyloxy)-3-(dodecylsulfanyl)propyl |
| **tiuxetan** | *N*-(4-{(2*S*)-2-[bis(carboxymethyl)amino]-3-[(2*RS*)-{2-[bis(carboxymethyl)amino]propyl}(carboxymethyl)amino]propyl}phenyl)thiocarbamoyl |
| **tocoferil** | *rac*-(2*R*)-2,5,7,8-tetramethyl-2-[(4*R*,8*R*)-4,8,12-trimethyltridecyl]chroman-6-yl |
| **tofesilate** | 3-(1,3-dimethyl-2,6-dioxo-1,2,3,6-tetrahydro-7*H*-purin-7-yl)ethane-1-sulfonate |
| **tosilate (tosylate)** | 4-methylbenzene-1-sulfonate or toluene-4-sulfonate |
| **triclofenate** | 2,4,5-trichlorophenolate |
| **triflutate** | trifluoroacetate |
| **trioleate** | (9*Z*)-octadec-9-enoate(3) or tris[(9*Z*)-octadec-9-enoate] |
| **tristearate** | octadecanoate(3) or tris(octadecanoate) |
| **trolamine** | 2,2′,2″-nitrilotriethanol or triethanolamine |
| **troxundate** | [2-(2-ethoxyethoxy)ethoxy]acetate or 3,6,9-trioxaundecanoate |
| **undecylate** | undecanoate |
| **undecylenate** | undec-10-enoate |
| **valerate** | pentanoate |
| **xinafoate** | 1-hydroxynaphthalene-2-carboxylate or 1-hydroxy-2-naphthoate |

# Atomic Weights of the Elements— $^{12}C=12$

| Atomic Number | Name | Symbol | Atomic Weight |
|---|---|---|---|
| 89 | Actinium | Ac | * |
| 13 | Aluminium | Al | 26.9815386 |
| 95 | Americium | Am | * |
| 51 | Antimony | Sb | 121.760 |
| 18 | Argon | Ar | 39.948 |
| 33 | Arsenic | As | 74.92160 |
| 85 | Astatine | At | * |
| 56 | Barium | Ba | 137.327 |
| 97 | Berkelium | Bk | * |
| 4 | Beryllium | Be | 9.012182 |
| 83 | Bismuth | Bi | 208.98040 |
| 107 | Bohrium | Bh | * |
| 5 | Boron | B | 10.811 |
| 35 | Bromine | Br | 79.904 |
| 48 | Cadmium | Cd | 112.411 |
| 55 | Caesium | Cs | 132.9054519 |
| 20 | Calcium | Ca | 40.078 |
| 98 | Californium | Cf | * |
| 6 | Carbon | C | 12.0107 |
| 58 | Cerium | Ce | 140.116 |
| 17 | Chlorine | Cl | 35.453 |
| 24 | Chromium | Cr | 51.9961 |
| 27 | Cobalt | Co | 58.933195 |
| 29 | Copper | Cu | 63.546 |
| 96 | Curium | Cm | * |
| 110 | Darmstadtium | Ds | * |
| 105 | Dubnium | Db | * |
| 66 | Dysprosium | Dy | 162.500 |
| 99 | Einsteinium | Es | * |
| 68 | Erbium | Er | 167.259 |
| 63 | Europium | Eu | 151.964 |
| 100 | Fermium | Fm | * |
| 9 | Fluorine | F | 18.9984032 |
| 87 | Francium | Fr | * |
| 64 | Gadolinium | Gd | 157.25 |
| 31 | Gallium | Ga | 69.723 |
| 32 | Germanium | Ge | 72.64 |
| 79 | Gold | Au | 196.966569 |
| 72 | Hafnium | Hf | 178.49 |
| 108 | Hassium | Hs | * |
| 2 | Helium | He | 4.002602 |
| 67 | Holmium | Ho | 164.93032 |
| 1 | Hydrogen | H | 1.00794 |
| 49 | Indium | In | 114.818 |
| 53 | Iodine | I | 126.90447 |
| 77 | Iridium | Ir | 192.217 |
| 26 | Iron | Fe | 55.845 |
| 36 | Krypton | Kr | 83.798 |
| 57 | Lanthanum | La | 138.90547 |
| 103 | Lawrencium | Lr | * |
| 82 | Lead | Pb | 207.2 |
| 3 | ‡Lithium | Li | 6.941 |
| 71 | Lutetium | Lu | 174.9668 |
| 12 | Magnesium | Mg | 24.3050 |
| 25 | Manganese | Mn | 54.938045 |
| 109 | Meitnerium | Mt | * |
| 101 | Mendelevium | Md | * |
| 80 | Mercury | Hg | 200.59 |
| 42 | Molybdenum | Mo | 95.96 |
| 60 | Neodymium | Nd | 144.242 |
| 10 | Neon | Ne | 20.1797 |
| 93 | Neptunium | Np | * |
| 28 | Nickel | Ni | 58.6934 |
| 41 | Niobium | Nb | 92.90638 |
| 7 | Nitrogen | N | 14.0067 |
| 102 | Nobelium | No | * |
| 76 | Osmium | Os | 190.23 |
| 8 | Oxygen | O | 15.9994 |
| 46 | Palladium | Pd | 106.42 |
| 15 | Phosphorus | P | 30.973762 |
| 78 | Platinum | Pt | 195.084 |
| 94 | Plutonium | Pu | * |
| 84 | Polonium | Po | * |
| 19 | Potassium | K | 39.0983 |
| 59 | Praseodymium | Pr | 140.90765 |
| 61 | Promethium | Pm | * |
| 91 | †Protactinium | Pa | 231.03588 |
| 88 | Radium | Ra | * |
| 86 | Radon | Rn | * |
| 75 | Rhenium | Re | 186.207 |
| 45 | Rhodium | Rh | 102.90550 |
| 111 | Roentgenium | Rg | * |
| 37 | Rubidium | Rb | 85.4678 |
| 44 | Ruthenium | Ru | 101.07 |
| 104 | Rutherfordium | Rf | * |
| 62 | Samarium | Sm | 150.36 |
| 21 | Scandium | Sc | 44.955912 |
| 106 | Seaborgium | Sg | * |
| 34 | Selenium | Se | 78.96 |
| 14 | Silicon | Si | 28.0855 |
| 47 | Silver | Ag | 107.8682 |
| 11 | Sodium | Na | 22.98976928 |
| 38 | Strontium | Sr | 87.62 |
| 16 | Sulfur | S | 32.065 |
| 73 | Tantalum | Ta | 180.94788 |
| 43 | Technetium | Tc | * |
| 52 | Tellurium | Te | 127.60 |
| 65 | Terbium | Tb | 158.92535 |
| 81 | Thallium | Tl | 204.3833 |
| 90 | †Thorium | Th | 232.03806 |
| 69 | Thulium | Tm | 168.93421 |
| 50 | Tin | Sn | 118.710 |
| 22 | Titanium | Ti | 47.867 |
| 74 | Tungsten | W | 183.84 |
| 112 | Ununbium | Uub | * |
| 116 | Ununhexium | Uuh | * |
| 118 | Ununoctium | Uuo | * |
| 115 | Ununpentium | Uup | * |
| 114 | Ununquadium | Uuq | * |
| 113 | Ununtrium | Uut | * |
| 92 | †Uranium | U | 238.02891 |
| 23 | Vanadium | V | 50.9415 |
| 54 | Xenon | Xe | 131.293 |
| 70 | Ytterbium | Yb | 173.054 |
| 39 | Yttrium | Y | 88.90585 |
| 30 | Zinc | Zn | 65.38 |
| 40 | Zirconium | Zr | 91.224 |

Elements marked (*) have no stable nuclides and IUPAC states "there is no general agreement on which of the isotopes of the radioactive elements is, or is likely to be judged 'important' and various criteria such as 'longest half-life', 'production in quantity', 'used commercially', etc., have been applied in the Commission's choice." However, atomic weights are given for radioactive elements marked (†) as they do have a characteristic terrestrial isotopic composition. Commercially available lithium (‡) materials have atomic weights ranging from 6.939 to 6.996; if a more accurate value is required, it must be determined for the specific material.

IUPAC Commission on Atomic Weights and Isotopic Abundances. Atomic Weights of the Elements 2007. Available at http://www.chem.qmul.ac.uk/iupac/AtWt/