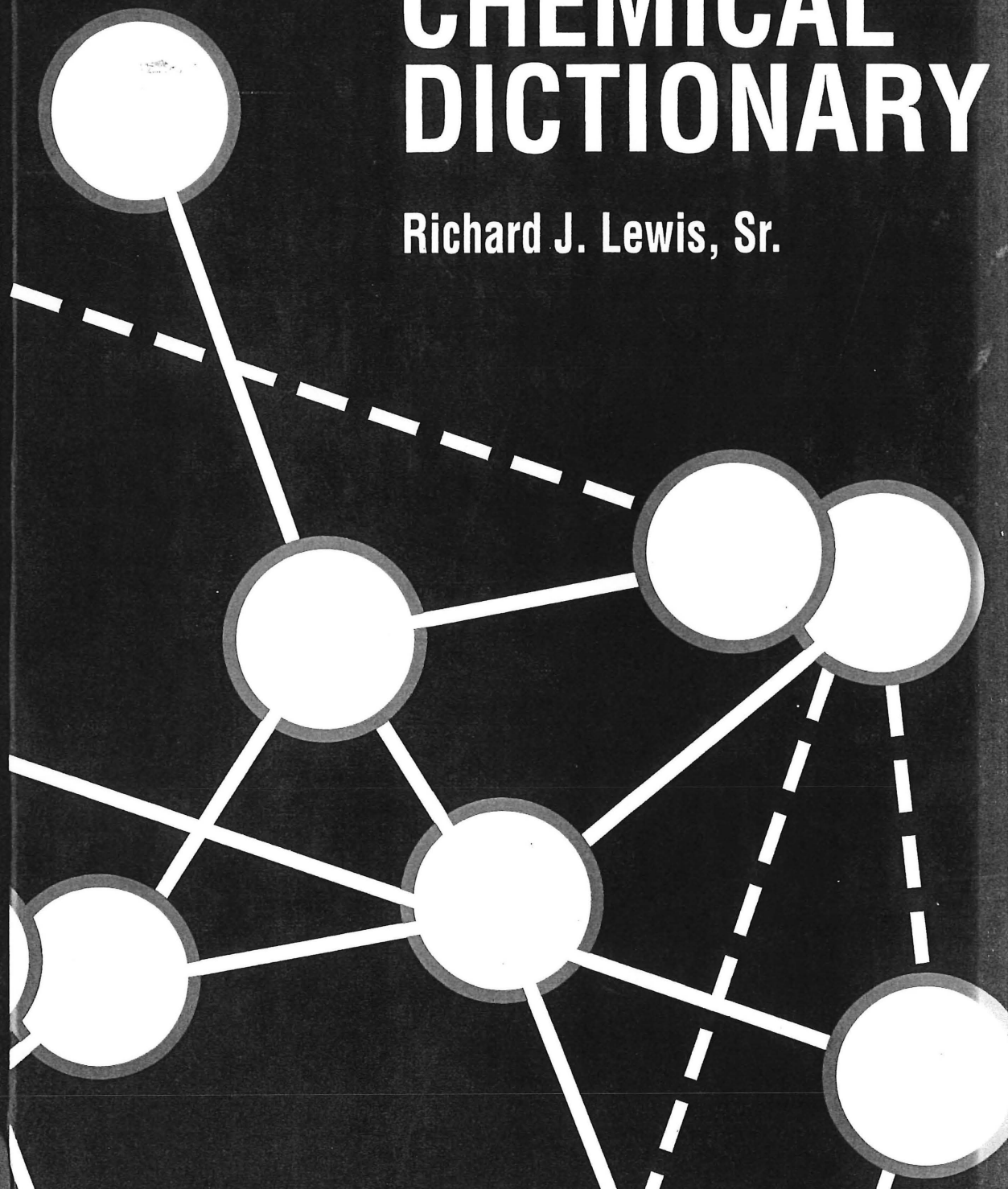


Hawley's

Twelfth Edition

CONDENSED CHEMICAL DICTIONARY

Richard J. Lewis, Sr.



Hawley's
Condensed Chemical
Dictionary

TWELFTH EDITION

Revised by
Richard J. Lewis, Sr.



VAN NOSTRAND REINHOLD COMPANY
New York

Copyright © 1993 by Van Nostrand Reinhold

Library of Congress Catalog Card Number 92-18951
ISBN 0-442-01131-8

All rights reserved. Certain portions of this work © 1930, 1920, 1919 by The Chemical Catalog Co., Inc., and 1987, 1981, 1977, 1971, 1966, 1956, 1950 by Van Nostrand Reinhold. No part of this work covered by the copyright hereon may be reproduced or used in any form or by any means—graphic, electronic, or mechanical, including photocopying, recording, taping, or informational storage and retrieval systems—without written permission of the publisher.

Printed in the United States of America

Published by Van Nostrand Reinhold
115 Fifth Avenue
New York, NY 10003

Chapman and Hall
2-6 Boundary Row
London, SE1 8HN

Thomas Nelson Australia
102 Dodds Street
South Melbourne 3205
Victoria, Australia

Nelson Canada
1120 Birchmount Road
Scarborough, Ontario M1K 5G4, Canada

16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

Library of Congress Cataloging-in-Publication Data

Condensed chemical dictionary.

Hawley's condensed chemical dictionary.—12th ed./revised by

Richard J. Lewis, Sr.

p. cm.

ISBN 0-442-01131-8

I. Chemistry—Dictionaries. I. Hawley, Gessner Goodrich, 1905-1983

II. Lewis, Richard J., Sr. III. Title.

QD5.C5 1992

540'.3—dc20

92-18951

CIP

uid hydrogen in high thrust nuclear rocket engines; carbon dioxide, propylene glycol, and "Dowtherm" in chemical processing reactors. Methoxypropanol has been introduced for diesel engines. Some coolants provide antifreeze protection.

See also antifreeze.

Coolidge, William D. (1873–1975). An American physical chemist born in Massachusetts. He received a degree in electrical engineering at M.I.T. (1896) and a doctorate in physics at Leipzig (1899). In 1905, he joined the General Electric Research Laboratory, which had been established five years earlier. Here he invented the ductile tungsten filament and developed the use of tungsten in electrical switches and medical x-ray tubes. He did pioneer research in experimental metallurgy and powder metallurgy. He also had a prominent part in evaluating uranium research (1941) and in setting up the Manhattan project. He was the recipient of many honors and awards, including induction into the National Inventors Hall of Fame in 1975.

cooperage. The manufacture of barrels, formerly of wood but now including drums made of various materials such as resin-bonded fiber, metal, and plastic.

coordinate bond. (dative bond). A covalent bond consisting of a pair of electrons donated by only one of the two atoms it joins.

coordination compound. (complex compound). A compound formed by the union of a metal ion (usually a transition metal) with a non-metallic ion or molecule called a ligand or complexing agent. The ligand may be either positively or negatively charged (such ions as Cl^- or NH_2NH_3^+) or it may be a molecule of water or ammonia. The most common metal ions are those of cobalt, platinum, iron, copper, and nickel, which form highly stable compounds. When ammonia is the ligand, the compounds are called amines. The total number of bonds linking the metal to the ligand is called its coordination number. It is usually 2, 4, or 6, and often depends on the type of ligand involved. All ligands have electron pairs on the coordinating atom (e.g., nitrogen) that can be either donated to or shared with the metal ions. The metal ion acts as a Lewis acid (electron acceptor), and the ligand as a Lewis base (electron donor). The bonding is neither covalent nor electrostatic, but may be considered intermediate between the two types. The charge on the complex ion is the sum of the charges on the metal ion and the ligands; for example, $4\text{NH}_3 + 2\text{Cl}^- + \text{Co}^{+3}$ forms the complex $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^+$.

The brackets enclose the metal ion and the coordinated ligands.

See also chelate, sequestration, metallocene.

coordination isomerism. Isomerism due to two central atoms, one in the positive complex and one in the negative complex.

coordination number. (CN). The number of points at which ligands are attached to the metal ion in a complex. Common coordination numbers are 2, 4, and 6, exemplified by the ions $[\text{Ag}(\text{NH}_3)_2]^+$, $[\text{Ni}(\text{CN})_4]^{2-}$, and $[\text{PdCl}_6]^{2-}$.

copaiba oil. A levorotatory, essential oil obtained from a tree native to Brazil; a component of copaiba resin (a type of balsam). The sap of this tree is a turpentine-like liquid which can be used as an automotive fuel; intensive cultivation of copaiba trees for this purpose is under experimentation in Brazil.

copaiba resin. See balsam (3), copaiba oil.

copaivic acid. $\text{C}_{20}\text{H}_{30}\text{O}_2$. A monobasic acid derived from copaiba balsam.

copal. A group of fossil resins still used to some extent in varnishes and lacquers. Insoluble in oils and water. The most important types are Congo, kauri, and manila.

Cope elimination reaction. Formation of an olefin and a hydroxylamine by pyrolysis of an amine oxide.

Cope rearrangement. Thermal isomerization of 1,5-dienes by 1,3,3 shift.

"Copherol" [Henkel]. CAS: 7695-91-2.

TM for natural tocopheryl acetate source of vitamin E.

Use: As an antioxidant and moisturizer for topical skin care and sunscreen products.

copigment. A material which forms an unstable addition compound with the anthocyanin pigment of flowers, such as tannin.

copolymer. An elastomer produced by the simultaneous polymerization of two or more dissimilar monomers, as SBR synthetic rubber from styrene and butadiene.

copper. CAS: 7440-50-8. Cu. Metallic element of atomic number 29, of group IB of the periodic system, aw 63.546, valences 1, 2; two stable isotopes.

Properties: Distinctive reddish color, d 8.96, mp 1083C, bp 2595C, ductile, excellent conductor of electricity. Complexing agent, coordination

emulsion polymerization. Polymerization reaction carried out with the reactants in emulsified form. Performed at normal pressure -20 – $+60$ C. Many copolymers (synthetic rubbers) are made in this way.

“Emulvis” [Hall]. TM for polyoxyethylene stearate.

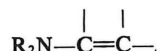
Use: Viscosity builder and solubility retarder for cosmetics, soaps, and shampoos.

en. Abbreviation for ethylenediamine, used in formulas for coordination compounds, e.g., the cobalt complex $\text{Co}[\text{en}]_3(\text{NO}_3)_3$.
See also dien, pn, py.

enamel. (1) A type of paint consisting of an intimate dispersion of pigments in a varnish or resin vehicle. The vehicle may be an oil-resin mix or entirely synthetic resin. Those containing drying oils are converted to films by oxidation; those comprised wholly of synthetic resins may be converted by either heat or oxidation, or both.
See also baking finish.

(2) Porcelain enamel.

enamine. A group of amino olefins; the name refers especially to unsaturated tertiary amines of the general formula



where R is any alkyl group. Though of little use as end products, enamines are valuable intermediates for many organic syntheses.

enanthaldehyde. See heptanal.

enanthic acid. See n-heptanoic acid.

enanthyl alcohol. See heptyl alcohol.

enantiomer. (enantiomorph). One of a pair of optical isomers containing one or more asymmetric carbon atoms C^* whose molecular configurations have left- and right-hand (chiral) forms. These forms are conventionally designated dextro (D) and levo (L) because they compare to each other structurally as do the right and left hands when the carbon atoms are lined up vertically. This is apparent in the enantiomorphous forms of glyceraldehyde; the two structures are mirror images of each other and cannot be made to coincide:



Several pairs of enantiomers are possible, depending on the number of asymmetric carbon atoms in the molecule. Compounds in which an asymmetric carbon is present display optical rotation.

See also asymmetry, optical isomer, optical rotation.

enantiomorph. See enantiomer.

encapsulation. The process in which a material or an assembly of small, discrete units is coated with or imbedded in a molten film, sheath, or foam, usually of an elastomer. A foam-forming plastic may be used to fill the spaces between various electrical or electronic components so that they are imbedded in and supported by the foam. Plastics and other materials used for this purpose are often called potting compounds. A specialized use of this technique is in growing crystals for semiconductors in which a coating of liquid boric oxide is the encapsulating agent. Use of a glassy silicate coating to encapsulate nuclear waste for permanent disposal is under investigation.

See also microencapsulation.

“Endic” Anhydride [Velsicol]. TM for endo-cis-bicyclo(2.2.1)-5-heptene-2,3-dicarboxylic anhydride. ($\text{C}_9\text{H}_8\text{O}_3$).

Properties: White crystals; mp 163C; soluble in aromatic hydrocarbons, acetone, ethanol.

Use: Elastomers, plasticizers, fire retardant chemicals, resins, and epoxy curing systems.

endo- A prefix used in chemical names to indicate an inner position, specifically (1) in a ring rather than a side chain or (2) attached as a bridge within a ring.

See also exo-

endomycin. An antifungal antibiotic complex produced by streptomycetes.

“Endor” [Du Pont]. TM for a rubber peptizing agent containing activated zinc salt of pentachlorothiophenol. ($\text{C}_6\text{Cl}_5\text{S}$) $_2$ Zn and 80% inert filler.

Properties: Grayish-green powder, d 2.39.

endorphin. Any of a group of polypeptides formed in the brain tissue and pituitary gland of higher animals which are thought to control the transfer of signals at nerve junctions, thus ensuring that behavior patterns in the individual remain normal. Imbalance or malfunction of these polypeptides has been reported to be a factor in irrational and violent actions and other emotional disorders as well as in epilepsy and memory processes. This belongs to a developing

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.