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# Scent And Chemistry

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On the Scent

Chemistry and the Sense of Smell

A True Story of Perfume and Obsession

Fragrant

Neurobiology of Sensation and Reward

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The Chemistry of Fragrances

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The Case Against Fragrance

A Story of Perfume, Obsession, and the Last Mystery of the Senses

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The Emperor of Scent

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Perfumes and Perfumery

From Perfumer to Consumer

Adventures in Perfume and the Science of Smell

Biology of Floral Scent

The Fascination of Odors and their Chemical Perspectives

## HULL NATHANAEL

### On the Scent Elsevier

For as long as anyone can remember, a man named Luca Turin has had an uncanny relationship with smells. He has been compared to the hero of Patrick Süskind's novel *Perfume*, but his story is in fact stranger, because it is true. It concerns how he made use of his powerful gifts to solve one of the last great mysteries of the human body: how our noses work. Luca Turin can distinguish the components of just about any smell, from the world's most refined perfumes to the air in a subway car on the Paris metro. A distinguished scientist, he once worked in an unrelated field, though he made a hobby of collecting fragrances. But when, as a lark, he published a collection of his reviews of the world's perfumes, the book hit the small, insular business of perfume makers like a thunderclap. Who is this man Luca Turin, they demanded, and how does he know so much? The closed community of scent creation opened up to Luca Turin, and he discovered a fact that astonished him: no one in this world knew how smell worked. Billions and billions of dollars were spent creating scents in a manner amounting to glorified trial and error. The solution to the mystery of every other human sense has led to the Nobel Prize, if not vast riches. Why, Luca Turin thought, should smell be any different? So he gave his life to this great puzzle. And in the end, incredibly, it would seem that he solved it. But when enormously powerful interests are threatened and great reputations are at stake, Luca Turin learned, nothing is quite what it seems. Acclaimed writer Chandler Burr has spent four years chronicling Luca Turin's quest to unravel the mystery of how our sense of smell works. What has emerged is an enthralling, magical book that changes the way we think about that area between our mouth and our eyes, and its profound, secret hold on our lives.

### Chemistry and the Sense of Smell Elsevier

In recent years, our knowledge of the anatomy and physiology of olfaction has grown enormously, accompanied by a growing appreciation of scent. This is reflected in the fact that the 2004

Nobel Prize in Medicine was awarded for discoveries of 'Odorant Receptors and the Organization of the Olfactory System'. This book naturally supports such developments, and takes the reader on a fascinating fragrant journey around the world to some of the exciting places the author has visited during his 30 years of olfactory research. Following an introductory section to the world of natural scents, including their biological meaning and history, the fragrance and flavor chemist, Roman Kaiser, who is renowned for his 'headspace' analytical technique, revisits some memorable scents. In doing so, he leads us to such exotic places as Lower Amazonia, Papua New Guinea, India, and many rain-forest biotopes in his quest for new molecules and new scent concepts, showing us along the way how a scent like tatami can be linked to culture. The third and final section describes the analysis of the compositions of the presented scents.

### *A True Story of Perfume and Obsession* CRC Press

This book is an introduction to the world of aroma chemicals, essential oils, fragrances and flavour compositions for the food, cosmetics and pharmaceutical industry. Present technology, the future use of resources and biotechnological approaches for the production of the respective chemical compounds are described. The book has an integrated and interdisciplinary approach on future industrial production and the issues related to this topic.

### **Fragrant** Singing Dragon

Comprehensively teaches all of the fundamentals of fragrance chemistry Ernest Beaux, the perfumer who created Chanel No. 5, said, "One has to rely on chemists to find new aroma chemicals creating new, original notes. In perfumery, the future lies primarily in the hands of chemists." This book provides chemists and chemists-to-be with everything they need to know in order to create welcome new fragrances for the world to enjoy. It offers a simplified introduction into organic chemistry, including separation techniques and analytical methodologies; discusses the structure of perfume creation with respect to the many reactive ingredients in consumer products; and shows how to formulate effective and long-lasting scents. Fundamentals of Fragrance Chemistry starts by covering the structure of matter in order to show how its building blocks are held together. It continues with chapters that look at hydrocarbons and

heteroatoms. A description of the three states of matter and how each can be converted into another is offered next, followed by coverage of separation and purification of materials. Other chapters examine acid/base reactions; oxidation and reduction reactions; perfume structure; the mechanism of olfaction; natural and synthetic fragrance ingredients; and much more. - Concentrates on aspects of organic chemistry, which are of particular importance to the fragrance industry -Offers non-chemists a simplified yet complete introduction to organic chemistry?from separation techniques and analytical methodologies to the structure of perfume creation -Provides innovative perfumers with a framework to formulate stable fragrances from the myriad of active ingredients available -Looks at future trends in the industry and addresses concerns about sustainability and quality management Fundamentals of Fragrance Chemistry is an ideal resource for students who are new to the subject, as well as for chemists and perfumers already working in this fragrant field of science.

### *Neurobiology of Sensation and Reward* Penguin

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*Smellosophy* W. W. Norton & Company

One man's passion for perfume leads him to explore one of the most intriguing scientific mysteries: What makes one molecule smell of garlic while another smells of rose? In this witty, engrossing, and wildly original volume, author Luca Turin explores the two competing theories of smell. Is scent determined by molecular shape or molecular vibrations? Turin describes in fascinating detail the science, the evidence, and the often contentious debate—from the beginnings of organic chemistry to the present day—and pays homage to the scientists who went before. With its uniquely accessible and captivating approach to science via art, *The Secret of Scent* will appeal to anyone who has ever wondered about the most mysterious of the five senses.

**The Chemistry of Fragrances** Springer

This treatise provides a broad overview of the many important aspects involved in the creation of perfumes and a fundamental understanding of the chemical basis of perfumery. The emphasis is on the development of fine fragrances for both students and those seeking a more in-depth knowledge of perfumery. This book is divided into five chapters: Essential Oils and Odorants, Perfumes - History and Modern Perfumery, Creation of a Perfume, Chemistry of Odorants and the Physiology and Theories of Smell. The first chapter covers the characteristics and isolation of some important essential oils from plant blossoms, leaves, roots & rhizomes, fruits, seeds, wood & bark, and plant exudates (resins). Also included in this chapter is a description of the characteristics of odorants from animal sources. Additional information about the chemical composition of many essential oils is covered in a later

chapter on Chemistry of Odorants. The basic structure and composition of perfumes is given in a separate chapter and more detailed descriptions are given for some of the historically important perfumes. Methods of training for perfumery are reviewed and several approaches for composing new fragrances are described in the chapter on Creation of Perfumes. The increasing use of computer technology and artificial intelligence in perfumery is also described. The chapter on the Chemistry of Odorants clarifies the structural character of the many aroma components utilized in perfumes. It is important to note that many of the chemical constituents derived from plants can be produced synthetically in the laboratory and many of the ingredients in perfumes on the market today are synthetic rather than plant derived. The final chapter covers the Physiology of Smell and the complicated Theory of Smell. The molecular structure and vibrational theories of smell are described and conclusions are reached about the most probable mechanism of smell.

Scent and Fragrances John Wiley & Sons

Plant volatiles—compounds emitted from plant organs to interact with the surrounding environment—play essential roles in attracting pollinators and defending against herbivores and pathogens, plant-plant signaling, and abiotic stress responses. *Biology of Plant Volatiles*, with contributions from leading international groups of distinguished scientists in the field, explores the major aspects of plant scent biology. Responding to new developments in the detection of the complex compound structures of volatiles, this book details the composition and biosynthesis of plant volatiles and their mode of emission. It explains the function and significance of volatiles for plants as well as insects and microbes whose interactions with plants are affected by these compounds. The content also explores the biotechnological and commercial potential for the manipulation of plant volatiles. Features: Combines widely scattered literature in a single volume for the first time, covering all important aspects of plant volatiles, from their chemical structures to their biosynthesis to their roles in the interactions of plants with their biotic and abiotic environment Takes an interdisciplinary approach, providing multilevel analysis from chemistry and genes to enzymology, cell biology, organismal biology and ecology Includes up-to-date methodologies in plant scent biology

research, from molecular biology and enzymology to functional genomics This book will be a touchstone for future research on the many applications of plant volatiles and is aimed at plant biologists, entomologists, evolutionary biologists and researchers in the horticulture and perfume industries.

**Fragrance Chemistry** Harper Collins

A text/reference regarding the structure and function of components used in perfume development and the process of developing perfumes. Covers gas chromatography, mass spectrometry and a host of other analytical techniques; the esthetics and techniques of perfume development; the manifold and ever-changing safety-related requirements of countries and customers; concerns about the environmental impact of materials and impurities which affect the perfumer's work.

**A Book of Perfume** Skyhorse

Winner of the 2016 Perfumed Plume Award The “Alice Waters of American natural perfume” (indieperfume.com) and author of the *Art of Flavor* celebrates our most potent sense, through five rock stars of the fragrant world Mandy Aftel is widely acclaimed as a trailblazer in natural perfumery. Over two decades of sourcing the finest aromatic ingredients from all over the world and creating artisanal fragrances, she has been an evangelist for the transformative power of scent. In *Fragrant*, through five major players in the epic of aroma, she explores the profound connection between our sense of smell and the appetites that move us, give us pleasure, make us fully alive. Cinnamon, queen of the Spice Route, touches our hunger for the unknown, the exotic, the luxurious. Mint, homegrown the world over, speaks to our affinity for the familiar, the native, the authentic. Frankincense, an ancient incense ingredient, taps into our longing for transcendence, while ambergris embodies our unquenchable curiosity. And exquisite jasmine exemplifies our yearning for beauty, both evanescent and enduring. In addition to providing a riveting initiation into the history, natural history, and philosophy of scent, *Fragrant* imparts the essentials of scent literacy and includes recipes for easy-to-make fragrances and edible, drinkable, and useful concoctions that reveal the imaginative possibilities of creating with—and reveling in—aroma. Vintage line drawings make for a volume that will be a treasured gift as well as a great read.

**Neurobiology of Chemical Communication** CRC Press

A big part of Dr. Joe's job as director of McGill University's Office of Science and Society is persuading people that the pursuit of science knowledge is a potential source of wonder, enlightenment and well-being for everyone. And as a chemist, he's particularly keen to rescue chemistry from the bad rep it's developed over recent decades. There is more to chemistry than toxins, pollution, and "Don't drink that soda--it's full of chemicals." The evangelic zeal Dr. Joe brings to his day job is of course also the driving force behind his work as an author. Once again, here he is to tell that everything is full of chemicals, and that chemistry means health, nutrition, beauty products, cleaning products, DNA, and the means by which Lady Gaga's meat dress was held together. In the style established with the bestselling *Brain Fuel*, each section here is themed and contains a mixture of short, pithy items and slightly longer mini-essays. And as before--but never with such energy and relish--Dr. Joe goes on the attack against charlatans in the alternative health trade, naming and shaming them in a particularly entertaining and edifying section of the book called "Claptrap." You will learn whether to put broccoli on a pizza before or after baking, whether beauty pills are worth taking, and whether the baby shampoo you're using is poisonous. You will discover but not use, please, the recipe for a Molotov cocktail. You will be enabled to enthrall fellow dinner guests with the derivation of the name Persil, and the definition of a kangarian (it's someone who only eats kangaroo meat). As ever, this torrent of entertainment is delivered in Dr. Joe's unmistakably warm, lively and authoritative voice.

*Flavours and Fragrances* Springer Science & Business Media  
 "I cannot recommend this fascinating book highly enough."  
 -Simon Cotton, *Chemistry & Industry*, September 2014  
 "In conclusion: A comprehensive introduction to the world of odours, not only for chemists." -review in German: *Monika Paduch, Gefahrstoffe - Reinhaltung Luft*, October 2014  
 A comprehensive overview of fragrance chemistry  
 Fragrance materials are universal, from personal care products to household cleaners, laundry products, and more. Although many of the scents themselves are synthesized in a lab, the actual mechanism of odour has long baffled chemists who attempt to model it for research. In *Chemistry and the Sense of Smell*, industry chemist Charles S. Sell explores the chemistry and biology surrounding the human detection and processing of odour, providing a

comprehensive, single-volume guide to the totality of fragrance chemistry. The correlation between molecular structure and odour is much more complex than initially thought, and the intricacies of the mechanism by which the brain interprets scent signals leaves much to be discovered. This book provides a solid foundation of fragrance chemistry and highlights the relationship between research and industry with topics such as: The analysis and characterization of odour The role scent plays in our lives The design and manufacture of new fragrance ingredients The relationship between molecular structure and odour The mechanism of olfaction Intellectual challenges and the future of the field Complete with illustrations that clarify difficult concepts and the structures of the molecules under discussion, *Chemistry and the Sense of Smell* is an all-inclusive guide to the science of scent. For professionals in the fragrance industry or related fields, this book is one resource that should not be overlooked.

*Flavours and Fragrances* Text Publishing

The olfactory journey described in this book introduces readers to the pleasures and benefits of educating and training the 'nose', our olfactory palate. Jennifer Peace Rhind explores the process of cultivating our sense of smell and demonstrates how the process itself can be therapeutic and enjoyable, as well as informative. She highlights the different skills involved, from olfactory vocabulary, awareness, and memory, through to discrimination and fragrance creation, and the activities that can help to acquire them, emphasizing the value of experiential learning. She describes the Japanese art of koh-do or the 'way of incense' and suggests ways of creating group events inspired by this. Based on her twenty five years' experience working with essential oils and aromatic plant extracts, she also leads the reader through a variety of scent families, with information on the botanical source, odour profiles, olfactory notes, and suggestions for comparison with other scents. This method of educating and training the 'nose' is fascinating, challenging and life-enhancing and will be of interest to anyone eager to develop their sense of smell, and of incalculable use to aromatherapy students and practitioners who must acquire these skills for their career.

*The Secret Life of Scent* John Wiley & Sons

The Emperor of Scent tells of the scientific maverick Luca Turin, a connoisseur and something of an aesthete who wrote a bestselling perfume guide and bandied about an outrageous new

theory on the human sense of smell. Drawing on cutting-edge work in biology, chemistry, and physics, Turin used his obsession with perfume and his eerie gift for smell to turn the cloistered worlds of the smell business and science upside down, leading to a solution to the last great mystery of the senses: how the nose works.

*Fundamentals of Fragrance Chemistry* Independently Published

This is a compilation of papers presented at the 1997 Flavours and Fragrances conference. The subject matter is intentionally broad, covering areas such as chemoreception, analytical techniques, essential oils and the synthesis of flavour and fragrance materials in the laboratory.

*The Case Against Fragrance* Springer

G}nther Ohloff supplies the researcher and practitioner in the field with fascinating ideas and introduces the interested layman to the fascinating world of fragrance, scent, and perfumes. His book presents a complete and highly up-to-date survey of the molecular basis of odor and scents and of the specific structure-activity relationships between fragrances and their receptors. It also covers to a wide extent neurophysiological aspects of olfaction. The author also describes the methods employed in the chemical synthesis of fragrances and the chemical modification of flavour and fragrance materials of natural origin. The book is completed by a description of 25 fragrances of plant and animal origin. From the contents: The Chemical Senses - Structure-Odor Relations - Quantitative OdorPerception - Description and Classification of Odor Impression - Odorants from Natural Starting Materials - Odorants from Petrochemical Starting Materials - Violet Odorants and Rose Ketones - Essential Oils -Animalic Compounds as Odorants.

**A Story of Perfume, Obsession, and the Last Mystery of the Senses** Royal Society of Chemistry

A pioneering exploration of olfaction that upsets settled notions of how the brain translates sensory information. Decades of cognition research have shown that external stimuli "spark" neural patterns in particular regions of the brain. This has fostered a view of the brain as a space that we can map: here the brain responds to faces, there it perceives a sensation in your left hand. But it turns out that the sense of smell—only recently attracting broader attention in neuroscience—doesn't work this way. A. S. Barwich asks a deceptively simple question: What does

the nose tell the brain, and how does the brain understand it? Barwich interviews experts in neuroscience, psychology, chemistry, and perfumery in an effort to understand the biological mechanics and myriad meanings of odors. She argues that it is time to stop recycling ideas based on the paradigm of vision for the olfactory system. Scents are often fickle and boundless in comparison with visual images, and they do not line up with well-defined neural regions. Although olfaction remains a puzzle, Barwich proposes that what we know suggests the brain acts not only like a map but also as a measuring device, one that senses and processes simple and complex odors. Accounting for the sense of smell upsets theories of perception philosophers have developed. In their place, Smellosophy articulates a new model for understanding how the brain represents sensory information. *Design, Performance and Classification* CRC Press

The Perfume Lover is a candid personal account of the process of composing a fragrance, filled with sensual scent descriptions, sexy tidbits, and historical vignettes. What if the most beautiful night in your life inspired a perfume? When Denyse Beaulieu was growing up near Montreal, perfume was forbidden in her house, spurring a childhood curiosity that became an intellectual and sensual passion. It is this passion she pursued all the way to Paris, where she now lives, and which led her to become a respected fragrance writer. But little did she know that it would also lead her to achieve a perfume lover's wildest dream: When Denyse tells famous perfumer Bertrand Duchaufour at L'Artisan Parfumeur of a sensual night spent in Seville under a blossoming orange tree, wrapped in the arms of a beautiful man, the story stirs his

imagination and together they create a scent that captures the essence of that night. As their unique creative collaboration unfolds, the perfume-in-progress conjures intimate memories, leading Beaulieu to make sense of her life through scents. Throughout the book, she weaves the evocative history of perfumery into her personal journey, in an intensely passionate voice: the masters and the masterpieces, the myths and the myth-busting, down to the molecular mysteries that weld our flesh to flowers. Now, just to set your nostrils aquiver: Séville à l'aube is an orange blossom oriental with zesty, green and balsamic effects, with notes of petitgrain, petitgrain citronnier, orange blossom, beeswax, incense, and lavender, and is now available at fragrance outlets in the U.S.

#### **Biology of Plant Volatiles** Wiley-VCH

Intraspecific communication involves the activation of chemoreceptors and subsequent activation of different central areas that coordinate the responses of the entire organism—ranging from behavioral modification to modulation of hormones release. Animals emit intraspecific chemical signals, often referred to as pheromones, to advertise their presence to members of the same species and to regulate interactions aimed at establishing and regulating social and reproductive bonds. In the last two decades, scientists have developed a greater understanding of the neural processing of these chemical signals. Neurobiology of Chemical Communication explores the role of the chemical senses in mediating intraspecific communication. Providing an up-to-date outline of the most recent advances in the field, it presents data from laboratory and wild species,

ranging from invertebrates to vertebrates, from insects to humans. The book examines the structure, anatomy, electrophysiology, and molecular biology of pheromones. It discusses how chemical signals work on different mammalian and non-mammalian species and includes chapters on insects, *Drosophila*, honey bees, amphibians, mice, tigers, and cattle. It also explores the controversial topic of human pheromones. An essential reference for students and researchers in the field of pheromones, this is also an ideal resource for those working on behavioral phenotyping of animal models and persons interested in the biology/ecology of wild and domestic species.

#### The Secret of Scent Butterworth-Heinemann

Modern perfumery is a blend of art, science and technology, with chemistry being the central science involved. The Chemistry of Fragrances aims to educate and entertain, and inform the audience of the very latest chemistry, techniques and tools applied to fragrance creativity. Beginning with the history of perfumes, which goes back over fifty thousand years, the book goes on to discuss the structure of the Perfume Industry today. The focus then turns to an imaginary brief to create a perfume, and the response to it, including that of the chemist and the creative perfumer. Consumer research, toxicological concerns, and the use of the electronic nose are some of the topics discussed on this journey of discovery. Written by respected experts in their fields, this unique book gives an insider view of ""mixing molecules"" from behind the portals of modern-day alchemy. It will be enjoyed by chemists and marketers at all levels.

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