

# Industry & Trade Summary

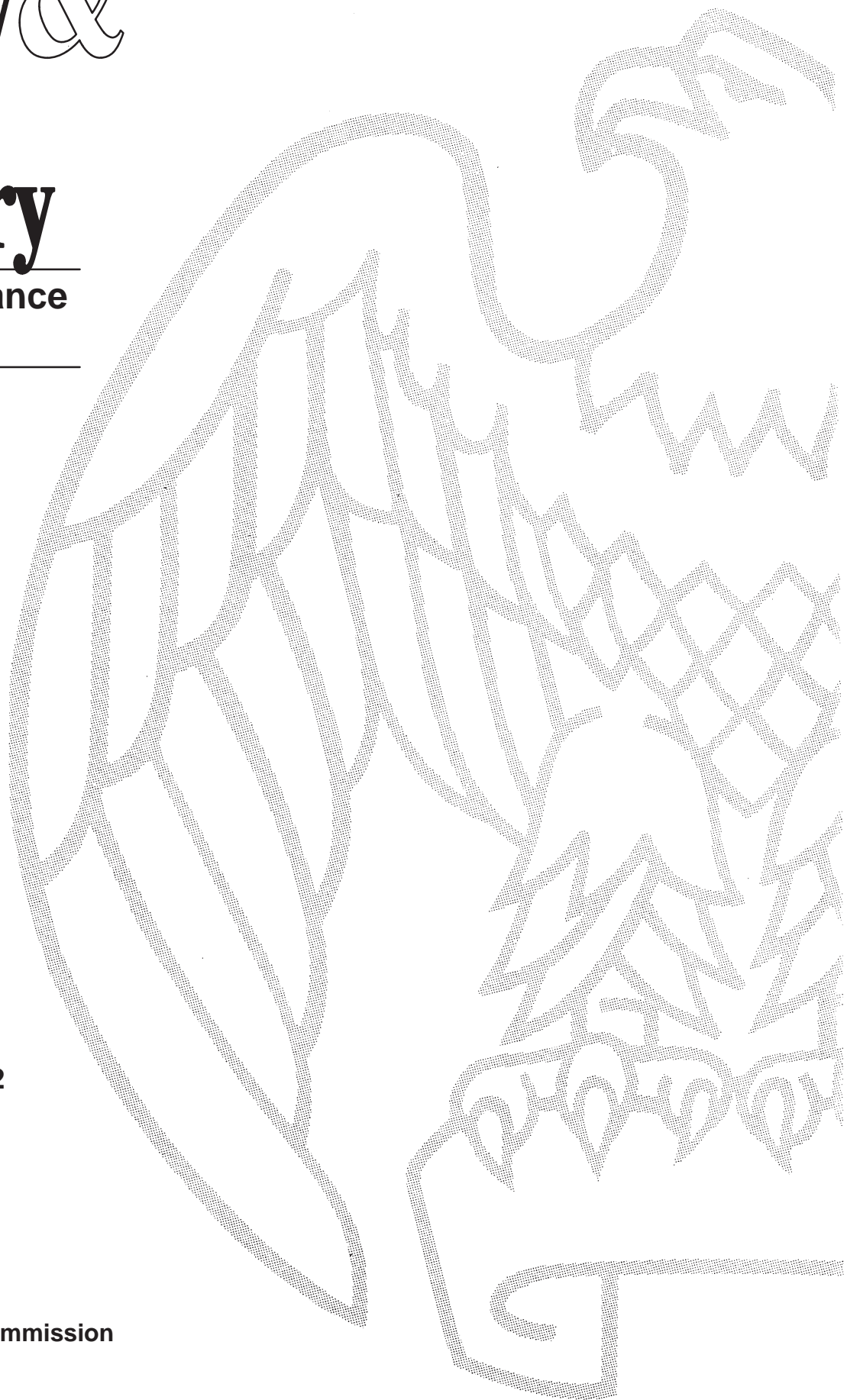
Flavor and Fragrance  
Materials

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USITC Publication 3162

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OFFICE OF INDUSTRIES  
U.S. International Trade Commission  
Washington, DC 20436



**UNITED STATES INTERNATIONAL TRADE COMMISSION**

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# PREFACE

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In 1991 the United States International Trade Commission initiated its current *Industry and Trade Summary* series of informational reports on the thousands of products imported into and exported from the United States. Each summary addresses a different commodity/industry area and contains information on product uses, U.S. and foreign producers, and customs treatment. Also included is an analysis of the basic factors affecting trends in consumption, production, and trade of the commodity, as well as those bearing on the competitiveness of U.S. industries in domestic and foreign markets.<sup>1</sup>

This report on Flavor and Fragrance Materials covers the period 1993 through 1997. Listed below are the individual summary reports published to date on the energy, chemicals, and textiles sectors.

## *USITC*

<i>publication number</i>	<i>Publication date</i>	<i>Title</i>
<b>Energy and Chemicals:</b>		
2458	November 1991 . . . . .	Soaps, Detergents, and Surface-Active Agents
2509	May 1992 . . . . .	Inorganic Acids
2548	August 1992 . . . . .	Paints, Inks, and Related Items
2578	November 1992 . . . . .	Crude Petroleum
2588	December 1992 . . . . .	Major Primary Olefins
2590	February 1993 . . . . .	Polyethylene Resins in Primary Forms
2598	March 1993 . . . . .	Perfumes, Cosmetics, and Toiletries
2736	February 1994 . . . . .	Antibiotics
2739	February 1994 . . . . .	Pneumatic Tires and Tubes
2741	February 1994 . . . . .	Natural Rubber
2743	February 1994 . . . . .	Saturated Polyesters in Primary Forms
2747	March 1994 . . . . .	Fatty Chemicals
2750	March 1994 . . . . .	Pesticide Products and Formulations
2823	October 1994 . . . . .	Primary Aromatics
2826	November 1994 . . . . .	Polypropylene Resins in Primary Formsi
2845	March 1995 . . . . .	Polyvinyl Chloride Resins in Primary Forms

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<sup>1</sup> The information and analysis provided in this report are for the purpose of this report only. Nothing in this report should be construed to indicate how the Commission would find in an investigation conducted under statutory authority covering the same or similar subject matter.

# PREFACE—*Continued*

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<i>USITC publication number</i>	<i>Publication date</i>	<i>Title</i>
<b>Energy and Chemicals—Continued:</b>		
2846	December 1994 . . . . .	Medicinal Chemicals, except Antibiotics
2866	March 1995 . . . . .	Hose, Belting, and Plastic Pipe
2943	December 1995 . . . . .	Uranium and Nuclear Fuel
2945	January 1996 . . . . .	Coal, Coke, and Related Chemical Products
3014	February 1997 . . . . .	Synthetic Rubber
3021	February 1997 . . . . .	Synthetic Organic Pigments
3081	March 1998 . . . . .	Explosives, Propellant Powders, and Related Items
3082	March 1998 . . . . .	Fertilizers
3093	March 1998 . . . . .	Adhesives, Glues, and Gelatin
<b>Textiles and apparel:</b>		
2543	August 1992 . . . . .	Nonwoven Fabrics
2580	December 1992 . . . . .	Gloves
2642	June 1993 . . . . .	Yarn
2695	November 1993 . . . . .	Carpets and Rugs
2702	November 1993 . . . . .	Fur Goods
2703	November 1993 . . . . .	Coated Fabrics
2735	February 1994 . . . . .	Knit Fabric
2841	December 1994 . . . . .	Cordage
2853	January 1995 . . . . .	Apparel
2874	April 1995 . . . . .	Manmade Fibers

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# ABSTRACT

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This report addresses trade and industry conditions in the flavor and fragrance materials industry for the period 1993-97.

- ! U.S. producers of flavor and fragrance materials range from large multinational firms that produce the majority of the high-volume materials to small producers that specialize in higher value-added, lower volume materials. The major products of this industry are essential oils, oleoresins, synthetic flavors and fragrances, and flavor and fragrance mixtures.
- ! U.S. producers of flavor and fragrance materials had annual shipments averaging approximately \$2.4 billion during 1993-97. The largest volume and value chemical produced by the U.S. industry is the non-caloric sweetener aspartame. Other major synthetic products of the U.S. flavor and fragrance industry include geraniol, citral, ionones, and methylionones. Major natural products include certain essential oils, such as mint oils and cedarwood oil, and particularly citrus oils, which are considered to be by-products by U.S. citrus fruit and juice producers. Also, specific products that are blends of synthetics and various oils and/or other flavor extracts have become a specialty of the U.S. industry during the 1990s.
- ! The U.S. duty level for a significant number of products covered in this report from MFN countries is free, as many of these materials are not available domestically. Additionally, almost all of the products that do not have a column 1 duty rate of zero are eligible for duty-free treatment through the Generalized System of Preferences.
- ! The primary U.S. consumers of these flavor and fragrance materials are perfume, cosmetic, and toiletry compounds. Often these firms are directly affiliated with the producer of the flavor and fragrance materials, as many major chemical and personal care products companies have acquired or developed subsidiaries for the specific purpose of having "in-house" suppliers. In general, flavor and fragrance materials are expected to be among the fastest growing of all chemical specialties areas, with an annual growth rate through 2002 anticipated to be about 5 percent.





# INTRODUCTION

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This report contains information concerning production, consumption, and trade in the flavor and fragrance materials industry, both in the United States and throughout the world. Most information in this report is provided for the 5-year period 1993-97.

The major products of this industry are either natural products, such as essential oils, oleoresins, and other natural plant extracts, or synthetic materials (synthetic organic chemicals with aromatic or odoriferous characteristics), or a combination of the two. These materials are used to impart the flavors and aromas in prepared foods, as well as to create the fragrances in household and personal care products.<sup>1</sup> In general, flavor and fragrance materials are marketed as industrial goods and incorporated into their respective consumer products either by food processors or producers of household or personal care products.<sup>2</sup>

The extraction processes used in the production of the natural flavors and fragrances are chemically simple operations, usually vacuum concentration followed by simple distillations, or solvent extractions. Most of the natural products, other than the singular essential oils and oleoresins (which are basic pure materials), are marketed in the form of alcohol-based solutions.

There is a wide variety of natural products used as flavor and fragrance materials. These products are differentiated according to the method of extraction and differences in the types of source material (e.g., various citrus peels, spices, plant leaf materials, other plant parts). By and large, most consumers of these products prefer natural flavor and fragrance materials to their chemically equivalent synthetic counterparts. Although flavor and fragrance chemists have labored for many years to exactly duplicate characteristic natural fragrances, there remain specific, discernible sensory differences between the natural products and their synthetic substitutes.<sup>3</sup> These sensory differences between natural and synthetic counterparts relate primarily to various "contaminating" materials routinely found in very small concentrations in natural products. These "contaminating" materials, found consistently in specific source materials, provoke slight sensory differences compared with the purer, unblemished synthetic counterparts. However, economic or even climatic factors may at times dictate the use of synthetic flavor and fragrance materials rather than the natural product.<sup>4</sup>

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<sup>1</sup> The products of this digest are included in various North American Industry Classification System (NAICS) categories. Essential oils are classified under NAICS 325998 (All Other Miscellaneous Chemical Product and Preparation Manufacturing). Other natural flavor and fragrance materials, synthetic flavor and fragrance materials, and mixtures of different flavor and fragrance materials are classified under NAICS 325199 (All Other Basic Chemical Manufacturing (pt)).

<sup>2</sup> The two notable exceptions to this rule are saccharin and aspartame, which may be marketed directly to consumers for personal use in other foods or drinks.

<sup>3</sup> Synthetic flavor and fragrance materials are produced by identifying, isolating, and then synthesizing as many of the individual chemical components determined to be contributors toward the flavor and fragrance characteristics of the natural product.

<sup>4</sup> For example, consumers that incorporate a natural material such as menthol in their consumer product will continue to use natural menthol even if price slightly exceeds that of a synthetic. However, as has occurred during the past decade, production of the natural product can be disrupted by severe weather conditions, thereby escalating the price to a level as much as five times higher. Such high costs and reduced availability have forced consumers to resort to

(continued...)

The flavor and fragrance materials industry was one of the first truly international industries, as there are specific necessary components for major products throughout the industry that are available from very few locations around the world. Although U.S. demand for the commonly available natural flavor and fragrance materials is generally satisfied by domestic production, a number of significant natural flavor and fragrance materials, such as certain animal products and specific essential oils and spice oleoresins<sup>5</sup> derived from non-indigenous plant materials, must be obtained from foreign sources.

Unlike many industries where the primary foreign competitors active in the U.S. market are large multinational firms, a large number of smaller foreign firms, many of which are brokers<sup>6</sup> of flavor and fragrance materials, remain competitive. Although in recent years a move towards consolidation among the larger multinational firms producing flavors and fragrances has resulted in the absorption of some of the smaller firms, a significant number of relatively small flavor and fragrance operations remain independent.

Large flavor and fragrance product brokers and major “flavor and fragrance houses”<sup>7</sup> function both as clearinghouses for local raw materials entering major world markets, and as producers of some flavor and fragrance materials from imported source materials.

## **U.S. INDUSTRY PROFILE**

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### **Industry Structure**

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Domestic firms supplying flavor and fragrance materials to the U.S. market range from large multinational firms<sup>8</sup> that produce the majority of the high-volume materials, to many smaller producers that specialize in higher value-added, lower volume materials. The smaller firms, most of which are not highly vertically integrated, each produce a number of products crucial to formulations of various types of consumer products. Purchasers of materials from these smaller firms may also be dependent on multiple sources to provide all of the necessary flavor and

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<sup>4</sup> (...continued)  
synthetic substitutes.

<sup>5</sup> Spice oleoresins are a natural liquid combination of resins and oils, which are solvent-extracted from plants and parts of plants.

<sup>6</sup> Brokers in the flavor and fragrance industry market a wide variety of products obtained primarily through purchases from various suppliers and, in some cases, their own production.

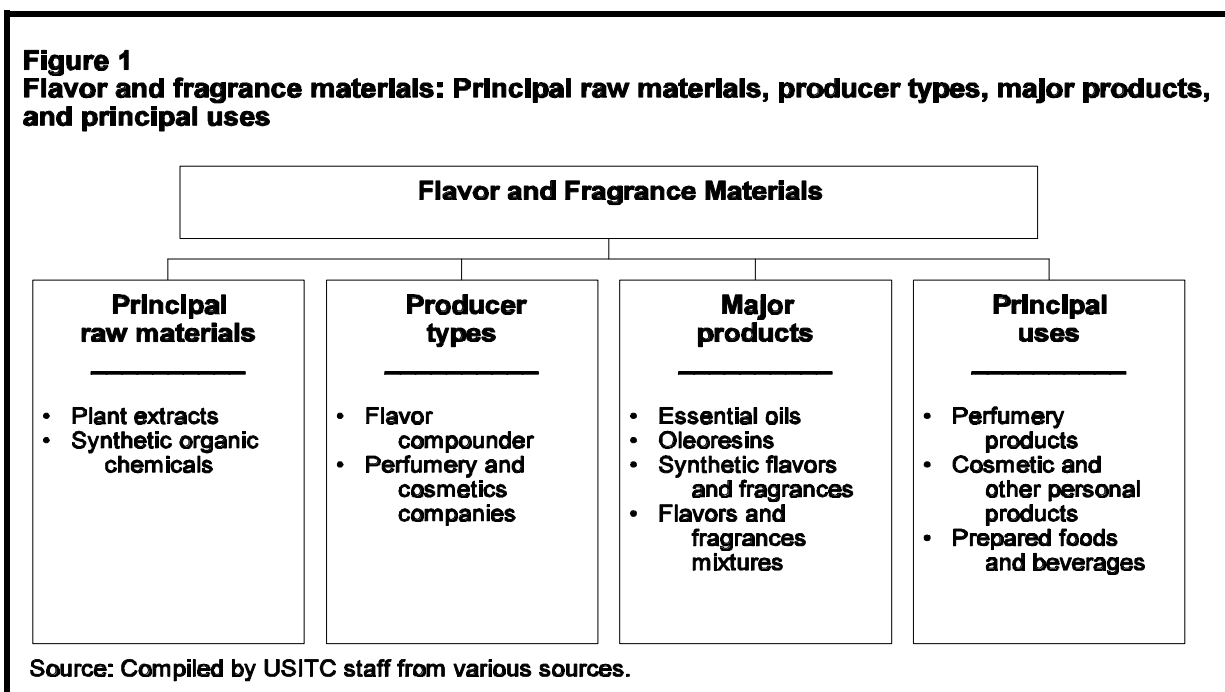
<sup>7</sup> Flavor and fragrance houses usually produce the majority of their own product from local raw materials and materials historically traded in the area. These producers generally only purchase finished flavor or fragrance materials produced by other producers when necessary for specialized products. These producers have been involved in the production of flavors and fragrances for many decades, often centuries, and are most often located in traditional Asian or European centers of commerce.

<sup>8</sup> Large multinationals based in the United States include International Flavors & Fragrances, Bush Boake Allen Inc., and Ungerer & Co. Smaller U.S.-based firms include Chemessence Inc., Elias Fragrances Inc., and Texarome Inc. *Cosmetics & Toiletries Cosmetics Bench Reference*, 1998, Allured Publishing Company, IL, 1998.

fragrance materials to formulate their consumer products, or to produce a fragrance or flavor mixture or a different compounded product.

The specific processes used to produce most individual essential oils and other natural flavoring materials are based on simple chemical extractions. However, mixtures or compounds of individual flavors that are marketed as specific aromas or flavors remain among the most closely guarded of industrial secrets. Because synthetic materials range from simple chemical compounds to more complicated chemicals, the range of production processes varies significantly. In many cases, these synthetic materials and their production processes are protected by patent law.

The typical consumer of flavor and fragrance materials is a food processor or a perfume, cosmetic, or toiletry compounder (figure 1). Often these firms are directly affiliated with the producer of the flavor and fragrance materials, as many major chemical and personal care products companies have acquired or developed subsidiaries for the specific purpose of having "in-house" suppliers. Other consumer firms that are not vertically integrated often form looser associations with suppliers that customize products to the users' specifications. Some of these associations promote consultations between producer and consumer early in the product development stages, ensuring that a close relationship will evolve. Such relationships guarantee the supplier of the flavor or fragrance material an assured market, assuming success of the final consumer product.<sup>9</sup>



Multinational companies based both in the United States, such as International Flavors & Fragrances, and overseas, such as Givaudan-Roure SA and Haarmann & Reimer GmbH, have U.S.

<sup>9</sup> W.A. Poucher, *The Production, Manufacture and Application of Perfumes, Perfumes - Cosmetics & Soaps, Volume 2* (New York: Chapman and Hall, London, and John Wiley & Sons, 1974), pp. 1-15; Ernest Guenther, *The Essential Oils*, D. Van Nostrand Company, Inc., 1948, pp. 3-14; and "World of Beauty - International Cosmetic Market," *Soap, Cosmetics, Chemical Specialties*, Sept. 1997, pp. 26-30.

facilities for producing flavor and fragrance materials for the U.S. market. Such large vertically integrated firms are typically involved in the entire production process, beginning as far back as the cultivation of the flora from which many of the natural fragrances and oils used in the industry are obtained, and culminating in the production of final consumer products. The smaller "specialty" companies, such as The Essential Oil Company, Inc., compete by carving out very specific niches, often based on one or a very few specialized fragrances. Such firms typically seek to maintain their competitive position through product innovation or proprietary technological advantage.

According to the U.S. Bureau of the Census, the number of firms producing flavor and perfume materials and the total value of shipments of these materials is shown in the following tabulation.<sup>10</sup>

<b>Standard Industrial Classification (SIC) Category</b>	<b>Number of firms with shipments of \$100,000 or more</b>	<b>Value of product shipments (million dollars)</b>
28693 13.—Chemical compounds for use as flavor and perfume materials, unmixed	27	1,617.8
28693 15.—Chemical compounds for use as flavor and perfume materials, mixed	17	271.0
28698 31.—Flavor oil mixtures and blends	14	205.1
28995 13.—Citrus fruit essential oils	16	105.0
28995 16.—Other essential oils	23	149.9

The largest individual value and volume chemicals in the flavor and fragrance chemicals area are the synthetic sweeteners saccharin and aspartame.<sup>11</sup> Sweeteners are the largest food additive in the U.S. food and beverage industry.

Geographically, the domestic industry is highly concentrated in the industrial Northeast, particularly in the New York-New Jersey area. Other major States where production is concentrated are California and Michigan, affording economies of transportation to their major customers.<sup>12</sup>

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<sup>10</sup> U.S. Bureau of the Census, *1992 Census of Manufactures, Industrial Organic Chemicals*, p. 28F-14, and U.S. Bureau of the Census, *1992 Census of Manufactures, Miscellaneous Chemical Products*, p. 28H-18. (Data were still being reported in terms of SIC categories).

<sup>11</sup> Data specific to these items remains confidential.

<sup>12</sup> U.S. Bureau of the Census, *1992 Census of Manufactures, Industrial Organic Chemicals*, p. 28F-16, and U.S. Bureau of the Census, *1992 Census of Manufactures, Miscellaneous Chemical Products*, p. 28H-21.

Employment in this industry remained fairly stable during 1993-97, because production of flavor and fragrance materials is dependent on demand from major consuming industries,<sup>13</sup> which do not fluctuate significantly with economic trends. Employment in the flavor and fragrance materials industry in 1992 is estimated to have been about 3,000.<sup>14</sup>

The level of labor intensity for the flavor and fragrance materials industry varies from firm to firm. Domestically, the industry is highly capital intensive, even though there have been few significant technological advances during the last century, with the exception of those related to synthetic compounds. In many foreign countries where exotic flora are available for use in production of flavors and fragrances, many of the extractions are still performed using the same production equipment and techniques as were used before World War II.

The relationships that exist throughout the U.S. industry (and also certain foreign industries) are based to a significant degree on the confidence of purchasers for the suppliers of the raw flavor and fragrance materials. Individual product success depends heavily on proprietary formulations used to generate a special fragrance or aroma, thereby provoking a specific sensory response. Such proprietary formulations are often incorporated into related "families" of products, such as perfumes and colognes, powders, shaving preparations, and other perfumed preparations. Since these formulations may be compounded from various types of materials purchased from flavor and fragrance companies, the ability to replicate the same product fragrance is dependent upon the consistency and homogeneity of the raw materials used and the reliability of the supplier. As such, the marketing of the flavor and fragrance materials to consuming companies requires very little additional effort on the part of suppliers once relationships are established.

Purchase of flavor and fragrance materials is generally by long-term contract. Such contracts benefit purchasers in two ways: (1) purchasers can be assured of product availability to the extent feasible, and (2) purchasers are not exposed to spot market pricing, which can be extremely volatile. The pricing of flavor and fragrance materials is heavily dependent on factors external to the industry, with the natural products that comprise a significant share of the industry often experiencing wide price variations. For example, during 1994-97, natural menthol prices ranged from approximately \$6 per pound to more than \$40 per pound because of weather-induced crop failures in China and worker strikes in Northern India.<sup>15</sup>

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<sup>13</sup> Personal care and household products.

<sup>14</sup> Estimated by the staff of the USITC based on information published in the *1992 Census of Manufactures*.

<sup>15</sup> "Menthol Continues Plunge; Pricing Floor is Uncertain," *Chemical Marketing Reporter*, Apr. 3, 1995, p. 24; "Menthol Prices Soar Worldwide as China and India Square Off," *Chemical Market Reporter*, Jan. 13, 1997, p. 20; and "Indian Producers Go on Strike, Halting Menthol Supplies," *Chemical Market Reporter*, June 16, 1997, p. 25. Note.—The name of the publication *Chemical Market Reporter* changed as of June 1996.

# U.S. MARKET

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## Consumer Characteristics and Factors Affecting Demand

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Almost all of the products of the flavor and fragrance materials industry are intended for industrial consumers; only synthetic non-caloric sweeteners (i.e., saccharin and aspartame) are marketed directly to the consuming public. The most significant factors that influence purchasing decisions by the industrial consumers are the sensory characteristics that the materials contribute to the final product, and the cost of the material.

As there is a strong correlation between the specific item used to impart a flavor or fragrance and the sensory characteristics of the resulting product, most industrial users will maintain their products' integrity within reasonable limits. However, if costs for natural materials escalate drastically (as in the previous example for menthol), synthetic materials that very closely mimic the natural product may be substituted. Different types of flavor and fragrance materials have certain distinctive properties that cause purchasers to favor their use. For example, spice oleoresins maintain the integrity of the actual spices and generally are able to circumvent concerns related to the possible spoilage of the spice.<sup>16</sup>

### *Consumption*

Apparent U.S. consumption of flavor and fragrance materials increased by 11.5 percent during 1993-97, mostly as a result of steadily increasing consumption of the products that incorporate these materials (table 1), particularly soft drinks and perfumery.<sup>17</sup> Synthetic sweeteners aspartame and saccharin account for a large share of the domestic consumption of flavor and fragrance materials. Estimates of the value of U.S. consumption of these low-calorie sweeteners range as high as \$1 billion, which would be about 40 percent of all flavor and fragrance material consumption in 1997.<sup>18</sup> The following tabulation shows an estimate of both the volume and value of the non-caloric sweeteners available in the U.S. market in 1996.<sup>19</sup>

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<sup>16</sup> Oleoresins have a much longer shelf-life than spices, are more hygienic (free from bacteria), can be strength-standardized, and contain natural antioxidants.

<sup>17</sup> "1997 Soft Drink Wrap Up," *Beverage Industry*, Aug. 1998, pp. 9-16, and "Outlook Rosy for Fragrance," *Discount Store News*, June 22, 1998, p. 35.

<sup>18</sup> "Ace-K Gets Approval," *Chemical Market Reporter*, July 6, 1998, p. 5.

<sup>19</sup> Estimates provided by SRI International in "New and Established Products Vie for a Share in a Growing Market," *Chemical Week*, Jun. 11, 1997, p. 32.

<b>Non-caloric sweetener</b>	<b>Amount consumed (1,000 metric tons)</b>	<b>Value of product consumed (million dollars)</b>
Aspartame .....	9.2	749
Saccharin .....	1.8	13
Acesulfame <sup>20</sup> .....	5.7	502
Total .....	16.7	1,264

Another area of potential growth for a particular type of flavor and fragrance material is in aromatherapy. The use of essential oils in behavior modification both in workplace and home settings is providing a potential new growth market for certain essential oils.<sup>21</sup> Although not a recent innovation,<sup>22</sup> new methods of delivery and a better understanding of the ways that aromatherapy affects behavior have provided a new impetus for growth within this industry segment.<sup>23</sup> Also, there is significant research into the development of new essential oils for aromatherapy products. Those recently developed include essential oils of lilac and lavender.<sup>24</sup>

**Table 1**  
**Flavor and fragrance materials: U.S. shipments, exports of domestic merchandise, imports for consumption, and apparent consumption, 1993-97**

<b>Year</b>	<b>U.S. shipments</b>	<b>U.S. exports</b>	<b>U.S. imports</b>	<b>Apparent U.S. consump tion<sup>1</sup></b>	<b>Ratio of imports to consumption</b>
	))))))))) Million dollars)))))))))				Percent
1993 .....	2,257	734	557	2,080	26.8
1994 .....	2,292	848	624	2,068	30.2
1995 .....	2,434	910	810	2,334	34.7
1996 .....	2,498	981	780	2,297	34.0
1997 .....	2,525	1,014	809	2,320	34.9

<sup>1</sup> Apparent consumption equals shipments plus imports minus exports.

Source: Compiled from official statistics of the U.S. Department of Commerce.

<sup>20</sup> While acesulfame was not approved for soft drink use in 1996, it was available for use as a sweetener for confections and baked goods, and as a tabletop sweetener.

<sup>21</sup> "Conditioning Indoor Environments Using Aroma Technology," *Drug & Cosmetic Industry*, Mar. 1998, pp. 18-21.

<sup>22</sup> "Aromatherapy," *Drug & Cosmetic Industry*, Mar. 1998, pp. 18-21.

<sup>23</sup> "Conditioning Indoor Environments Using Aroma Technology," *Drug & Cosmetic Industry*, Mar. 1998, pp. 18-21.

<sup>24</sup> "A Fragrant Future," *Drug & Cosmetic Industry*, June 1998, p. 42.

In general, flavor and fragrance materials are expected to be one of the fastest growing of all chemical specialties areas, with the annual growth rate through 2002 anticipated to be about 5 percent.<sup>25</sup> Other estimates of market growth through 2002 range as high as 7.3 percent.<sup>26</sup> The growth rate was slightly less than 3 percent during 1993-97.<sup>27</sup>

## *Production*

U.S. shipments of flavor and fragrance materials increased by 11.9 percent during 1993-97, with flavor oil mixtures and blends accounting for the largest part of the increase (table 2). Although synthetic sweeteners accounted for much of the production growth in this sector, an increasing share of the growth is attributable to new fragrance blends and mixtures prepared and marketed by flavor and fragrance houses.

**Table 2**  
**Flavor and fragrance materials: U.S. shipments, by type of material, 1993-97**

SIC <sup>1</sup> Classification	1993	1994	1995	1996	1997 <sup>2</sup>
	————— <i>Million dollars</i> —————				
28693 13.—Flavor and perfume materials, unmixed . . . . .	1,531	1,486	1,576	1,607	1,624
28693 15.—Flavor and perfume materials, mixed . . . . .	257	249	264	269	273
28698 31.—Flavor oil mixtures and blends . . . . .	208	268	286	321	324
28995 13.—Citrus fruit essential oils . . . . .	108	119	127	124	125
28995 16.—Other essential oils . . . . .	154	170	181	177	179
Total . . . . .	2,258	2,292	2,434	2,498	2,525

<sup>1</sup> Data were reported on an SIC basis during 1993-97.

<sup>2</sup> Estimated.

Source: Compiled from official statistics of the U.S. Department of Commerce.

This reflects a change in the industry; typically food processors and manufacturers of personal care products performed flavor and fragrance compounding. The growth rate in shipments of flavor oil mixtures of 56 percent significantly exceeds the industry average of 12 percent during 1993-97.

The largest volume chemical produced by the U.S. flavor and fragrance industry is aspartame. With the expiration of the patent on this material in December 1992, the NutraSweet® Company (owned by Monsanto) is no longer the only producer of this material in the domestic market.<sup>28</sup>

<sup>25</sup> “Specialties Slated for Strong Growth According to New Kline Report,” *Chemical Market Reporter*, Apr. 27, 1998, p. 33.

<sup>26</sup> “Flavor and Fragrances Update,” *Drug & Cosmetic Industry*, June 1998, p. 97.

<sup>27</sup> Derived from official statistics of the U.S. Department of Commerce.

<sup>28</sup> “Aspartame Is Pricing Driven,” *Chemical Marketing Reporter*, Nov. 20, 1995, p. 7.



However, Monsanto remains the world's largest producer of aspartame.<sup>29</sup> Other major synthetic products of the U.S. flavor and fragrance industry include geraniol, citral, ionones, and methylionones. Major natural products include certain essential oils, such as mint oils and cedarwood oil, and particularly citrus oils, which are considered a by-product by U.S. citrus fruit and juice producers. Also, specific blends of synthetics and various oils and/or other flavor extracts have become a specialty of the U.S. industry during the 1990s.

## U.S. TRADE

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### Overview

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U.S. trade in flavor and fragrance materials reflects the international nature of the flavor and fragrance market. A significant share of U.S. imports is comprised of materials that are produced in limited supply by firms located in select regions of the world and that are in high demand throughout the international industry. Restricted availability and high demand places significant pressure on U.S. consuming industries to maintain a guaranteed supply at a reasonable cost. As a result, price fluctuations for these materials are much greater than those seen in most other chemical trade areas.

The United States has historically maintained a positive balance of trade in flavor and fragrance materials, owing to its competitive strengths in production of certain endemic natural products (i.e., mint oils), and compounded flavors and fragrances that are in demand in the global market (table 3). The trade balance fluctuated during 1993-97, reaching a high of \$224.2 million in 1994 and a low of \$99.9 million in 1995. The trade balance in 1997 was \$204.8 million. Variations in the trade balance primarily result from significantly increased U.S. imports of aspartame from the Netherlands and drink mixes from Ireland, which outstripped steady increases across a broad range of U.S. flavor and fragrance material exports.

### U.S. Imports

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#### *Principal Suppliers and Import Levels*

Japan and France have historically been the principal suppliers of flavor and fragrance materials to the U.S. market (table 4). However, since the expiration of the patent on aspartame, significant imports of the material have entered the United States from the Netherlands.<sup>30</sup> These aspartame imports may account for as much as 17 percent of all flavor and fragrance imports.<sup>31</sup> In addition, in 1995 there was an increase in imports of flavor and fragrance materials that can be attributed to the basket subheading of "mixtures of flavors for use in drinks" from Ireland.

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<sup>29</sup> "New Ingredients Poised to Enter High-Intensity Sweeteners," *Chemical Market Reporter*, June 22, 1998, pp. F6-F8.

<sup>30</sup> The Holland Company has become a major international producer of aspartame.

<sup>31</sup> "How Sweet It Isn't at NutraSweet," *Business Week*, Dec. 14, 1992, p. 42 and "A Heap of Competition to Come," *Chemical Week*, Aug. 14, 1996, pp. 24-27.

U.S. imports increased significantly, by more than 45 percent, during 1993-97. The increase in aspartame imports contributed a large amount to this increase. Also, demand is increasing for certain natural flavor and fragrance inputs needed for new natural/synthetic mixtures currently in demand in the United States. A great number of these materials enter the U.S. market duty free according to their column 1 rates (table 5).<sup>32</sup> Additionally, almost all of the products that do not have a column 1 duty rate that is free are eligible for duty-free treatment under the Generalized System of Preferences.

Other than the recent changes in imports from Ireland and the Netherlands, the import product mix has remained fairly stable during 1993-97. For example, U.S. imports from Europe have traditionally been weighted toward higher value-added specialty products, such as compounded fragrances, while imports from other major sources including Mexico, Brazil, India, and China have been weighted toward natural products such as oleoresins, essential oils, and products derived directly from these materials.

### ***U.S. Trade Measures***

Table 5 shows the column 1 rate of duty for each eight-digit HTS subheading included in this summary; special rates, as applicable; and U.S. exports and imports for the latest full year available.

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<sup>32</sup> Many of these items are unavailable domestically and have column 1 duty rates of free. In some cases, the duty rates are free to maintain the competitiveness of domestic consuming industries vis-a-vis possible competitors that can obtain necessary components for their products from domestic sources.

Table 3

Flavor and fragrance materials: U.S. exports of domestic merchandise, imports for consumption, and merchandise trade balance, by selected countries and country groups, 1993-97

(Thousand dollars)

Item	1993	1994	1995	1996	1997
<b>U.S. exports of domestic merchandise :</b>					
Japan .....	132,739	162,055	154,784	174,168	126,495
Canada .....	111,306	127,991	150,916	166,623	178,187
Netherlands .....	22,488	31,765	36,803	37,876	36,917
France .....	33,550	35,792	39,138	37,597	51,397
Mexico .....	46,896	56,551	53,424	61,932	74,119
United Kingdom .....	40,741	48,639	52,209	63,442	64,331
Germany .....	24,604	31,374	30,546	32,442	44,500
Brazil .....	10,370	11,613	20,268	18,682	23,741
Switzerland .....	13,655	18,898	13,836	14,471	13,960
Ireland .....	10,716	14,775	19,712	17,537	17,704
All Other .....	287,019	308,774	338,661	356,140	382,944
Total .....	734,085	848,228	910,298	980,909	1,014,296
EU-15 .....	183,508	228,949	240,375	260,275	305,320
OPEC .....	22,986	20,338	20,068	20,100	24,002
Latin America .....	139,092	144,693	157,906	170,016	198,764
CBERA .....	25,770	22,471	22,839	30,296	36,288
Asian Pacific Rim .....	247,715	287,982	290,420	308,235	271,988
ASEAN .....	50,144	50,348	55,891	58,353	62,125
Central and Eastern Europe .....	3,149	2,537	7,640	6,063	7,937
<b>US imports for consumption :</b>					
Japan .....	106,677	111,582	116,000	93,835	98,508
Canada .....	19,833	26,509	39,880	21,152	21,276
Netherlands .....	14,321	31,556	76,435	78,998	88,575
France .....	71,866	78,769	75,604	72,934	72,511
Mexico .....	14,243	19,871	39,114	42,264	36,089
United Kingdom .....	17,025	25,261	37,956	28,698	26,119
Germany .....	25,434	28,301	31,927	27,517	29,782
Brazil .....	46,664	39,821	50,733	48,413	50,246
Switzerland .....	50,108	59,407	69,366	71,032	58,611
Ireland .....	1,518	2,324	41,594	59,547	52,959
All Other .....	188,940	200,611	231,778	235,504	274,810
Total .....	556,628	624,012	810,387	779,895	809,485
EU-15 .....	155,546	192,160	296,802	294,766	304,239
OPEC .....	16,395	17,021	16,714	15,001	28,977
Latin America .....	91,060	89,136	129,471	125,632	125,232
CBERA .....	4,733	6,110	9,506	6,250	5,768
Asian Pacific Rim .....	198,391	211,057	218,468	192,181	212,424
ASEAN .....	18,563	19,016	21,691	17,483	32,751
Central and Eastern Europe .....	3,944	4,356	5,102	4,888	6,247
<b>US merchandise trade balance:</b>					
Japan .....	26,062	50,473	38,784	80,333	27,987
Canada .....	91,473	101,483	111,037	145,471	156,911
Netherlands .....	8,167	209	-39,632	-41,122	-51,658
France .....	-38,315	-42,977	-36,466	-35,338	-21,114
Mexico .....	32,653	36,680	14,310	19,668	38,030
United Kingdom .....	23,716	23,378	14,253	34,744	38,212
Germany .....	-830	3,073	-1,381	4,925	14,718
Brazil .....	-36,294	-28,208	-30,465	-29,732	-26,504
Switzerland .....	-36,453	-40,509	-55,530	-56,562	-44,650
Ireland .....	9,198	12,451	-21,882	-42,010	-35,255
All Other .....	98,079	108,163	106,884	120,636	108,135
Total .....	177,457	224,216	99,911	201,014	204,812
EU-15 .....	27,962	36,789	-56,426	-34,491	1,081
OPEC .....	6,591	3,317	3,354	5,099	-4,975
Latin America .....	48,032	55,558	28,435	44,383	73,532
CBERA .....	21,037	16,361	13,333	24,047	30,519
Asian Pacific Rim .....	49,324	76,926	71,952	116,054	59,564
ASEAN .....	31,581	31,331	34,200	40,870	29,373
Central and Eastern Europe .....	-795	-1,819	2,538	1,175	1,690

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 4

**Flavor and fragrance materials: U.S. imports for consumption, by principal sources, 1993-97**

Source	1993	1994	1995	1996	1997
Value (1,000 dollars)					
Japan . . . . .	106,677	111,582	116,000	93,835	98,508
Netherlands . .	14,321	31,556	76,435	78,998	88,575
France . . . . .	71,866	78,769	75,604	72,934	72,511
India . . . . .	16,898	23,064	26,867	46,107	60,977
Switzerland . .	50,108	59,407	69,366	71,032	58,611
Ireland . . . . .	1,518	2,324	41,594	59,547	52,959
China . . . . .	41,795	51,667	56,062	49,133	52,303
Brazil . . . . .	46,664	39,821	50,733	48,413	50,246
Mexico . . . . .	14,243	19,871	39,114	42,264	36,089
Germany . . . .	25,434	28,301	31,927	27,517	29,782
All Other . . . .	167,104	177,650	226,684	190,115	208,924
Total . . . . .	556628	624012	810387	779895	80948

Source: Compiled from official statistics of the U.S. Department of Commerce.

## U.S. Exports

### *Principal Markets and Export Levels*

U.S. exports of flavor and fragrance materials increased by about 38 percent during 1993-97 (table 6). The largest increases were registered in exports to Canada and Mexico. During this period, these two markets accounted for increased exports valued at about \$94 million. Exports to Western Europe increased as well. Exports of flavor and fragrance materials to Japan during 1993-96 increased by 31 percent, but declined significantly in 1997, primarily owing to decreasing discretionary purchase power in Asian markets.<sup>33</sup>

The recent development of the U.S. industry niche that produces highly marketable product blends of flavors and fragrances significantly bolstered overall U.S. exports of flavor and fragrance materials. These specialty exports have been especially beneficial to the U.S. industry, expanding U.S. exports into markets that have traditionally been major suppliers of basic flavor and fragrance materials to the United States.

U.S. exports are expected to continue to increase with the further development of natural material blends by U.S. producers, and the expanding popularity of less expensive and less price-volatile synthetic materials.<sup>34</sup> In addition, recent growth in the sales of personal care products in Europe has increased demand for new flavor and fragrance materials. Moreover, as personal care products become more tailored to regional and national cultural requirements, niche markets requiring more specialty flavors and fragrances are developing, further expanding international demand.<sup>35</sup>

<sup>33</sup> Mike M. Mochizuki, "The East Asian Economic Crisis," *The Brookings Review*, Summer 1998, pp. 30-32; and "China and the Asian Contagion," *Foreign Affairs*, July/Aug. 1998, pp. 78-88.

<sup>34</sup> "Flavors and Fragrances Update," *Drug & Cosmetic Industry*, June 1998, p. 97.

<sup>35</sup> "Looking for Niche Markets in Europe," *Chemical Market Reporter*, May 11, 1998, pp. FR16-17.

**Table 5**

**Flavor and fragrance materials: *Harmonized Tariff Schedule* subheading; description; U.S. col. 1 rate of duty as of Jan. 1, 1998; U.S. exports and imports, 1997**

HTS subheading	Description	Col. 1 rate of duty as of Jan. 1, 1998		U.S. exports, 1997	U.S. imports, 1997
		General	Special <sup>1</sup>		
2904.20.30	5-tert-Butyl-2,4,6-trinitro-m-xylene (Musk xylol) and other artificial musks	5.7%	Free (A*,CA,E,IL,J,MX)	3,535	511
2905.22.10	Geraniol	3.0%	Free (A*,CA,E,IL,J,MX)	10,826	1,009
2906.11.00	Menthol	2.1%	Free (A*,CA,E,IL,J,MX)	5,238	58,817
2906.14.00	Terpineols	5.7%	Free (A*,CA,E,IL,J,MX)	2,248	854
2906.29.10	Phenethyl alcohol	12.0%	Free (A*,CA,E,IL,J,MX)	985	2,229
2906.29.20	Other odoriferous or flavoring compounds: aromatic cyclic alcohols and their halogenated, sulfonated, nitrated or nitrosated derivatives	9.3%	Free (A*,CA,E,IL,J,MX)	3,939	2,355
2909.30.10	6-tert-Butyl-3-methyl-2,4-dinitroanisole (Musk ambrette) and other artificial musks	5.7%	Free (A*,CA,E,IL,J,MX)	1,135	108
2909.30.20	Other odoriferous or flavoring compounds: aromatic ethers and their halogenated, sulfonated, nitrated or nitrosated derivatives	8.4%	Free (A*,CA,E,IL,J,MX)	2,271	1,448
2909.50.40	Other odoriferous or flavoring compounds: ether-phenols, ether-alcohol-phenols and their halogenated, sulfonated, nitrated or nitrosated derivatives	4.8%	Free (A*,CA,E,IL,J,MX)	3,104	6,954
2912.19.10	Citral	5.7%	Free (A*,CA,E,IL,J,MX)	5,251	4,922
2912.19.20	Other odoriferous or flavoring compounds: acyclic alcohols without other oxygen function	4.8%	Free (A*,CA,E,IL,J,MX)	10,502	10,734
2912.30.20	Hydroxycitronellal	4.8%	Free (A*,CA,E,IL,J,MX)	205	2,425

See notes at end of table

**Table 5—Continued**

**Flavor and fragrance materials: Harmonized Tariff Schedule subheading; description; U.S. col. 1 rate of duty as of Jan. 1, 1998; U.S. exports and imports, 1997**

HTS subheading	Description	Col. 1 rate of duty as of Jan. 1, 1998		U.S. exports, 1997	U.S. imports, 1997
		General	Special		
2912.41.00	Vanillin (4-Hydroxy-3-methoxybenzaldehyde)	6.1%	Free (A*,CA,E,IL,J,MX)	15,594	12,860
2912.42.00	Ethylvanillin (3-Ethoxy-4-hydroxy-benzaldehyde)	12.0%	Free (A*,CA,E,IL,J,MX)	3,243	10,722
2912.49.10	p-Anisaldehyde	6.0%	Free (A*,CA,E,IL,J,MX)	1,928	5,638
2912.49.15	p-Hydroxybenzaldehyde	Free		723	30
2912.49.25	Other aromatic aldehyde-ethers, aldehyde-phenols and aldehyde with other oxygen functions	9.3%	Free (A*,CA,E,IL,J,MX)	241	1,796
2912.49.50	Other aldehyde-ethers, aldehyde-phenols and aldehyde with other oxygen functions	4.8%	Free (A*,CA,E,IL,J,MX)	1,928	417
2914.23.00	Ionones and methylionones	5.7%	Free (A*,CA,E,IL,J,MX)	10,288	16,171
2915.39.10	Benzyl acetate	16.3%	Free (A*,CA,E,IL,J,MX)	472	1,541
2915.39.20	Other odoriferous or flavoring compounds: aromatic esters of acetic acid	9.3%	Free (A*,CA,E,IL,J,MX)	2,402	3,145
2915.39.45	Other odoriferous or flavoring compounds: esters of acetic acid	4.8%	Free (A*,CA,E,IL,J,MX)	14,778	21,715
2916.31.20	Odoriferous or flavoring compounds, benzoic acid its salts and esters	11.4%	Free (A*,CA,E,IL,J,MX)	7,879	189
2916.34.10	Phenylacetic acid (alpha-Toluic acid)	6.5%	Free (A+,CA,E,IL,J,MX)	52	97
2916.34.15	Other phenylacetic acid salts	9.7%	Free (A*,CA,E,IL,J,MX)	133	289
2916.35.15	Other odoriferous or flavoring compounds: phenylacetic acid esters	9.7%	Free (A*,CA,E,IL,J,MX)	93	1,321

See notes at end of table.

**Table 5—Continued**

**Flavor and fragrance materials: Harmonized Tariff Schedule subheading; description; U.S. col. 1 rate of duty as of Jan. 1, 1998; U.S. exports and imports, 1997**

HTS subheading	Description	Col. 1 rate of duty as of Jan. 1, 1998		U.S. exports, 1997	U.S. imports, 1997
		General	Special		
				-Million dollars-	
2916.39.20	Odoriferous or flavoring compounds: aromatic monocarboxylic acids, their anhydrides, halides, peroxides, peroxyacids and their derivatives	9.7%	Free (A*,CA,E,IL,J,MX)	146	626
2918.23.20	Odoriferous or flavoring compounds, other esters of salicylic acid and their salts	9.7%	Free (A*,CA,E,IL,J,MX)	294	14,210
2918.90.35	Odoriferous or flavoring compounds, other aromatic carboxylic acids with additional oxygen function	9.7%	Free (A*,CA,E,IL,J,MX)	4,396	417
2922.42.10	Monosodium glutamate	9.8%	Free (A+,CA,E,IL,J,MX)	19,938	21,750
2924.29.10	Acetanilide; N-acetylsulfanilyl chloride; aspartame, and 2-methoxy-5-acetamino-N,N-bis(2-acetoxy- ethyl)aniline	2.2 cents/kg + 13.5%	Free (A*,CA,E,IL,J,MX)	1,934	135,565
2925.11.00	Saccharin and its salts	6.6%	Free (A*,CA,E,IL,J,MX)	5,486	4,485
2932.21.00	Coumarin, methylcoumarins and ethyl-coumarins	14.6%	Free (A*,CA,E,IL,J,MX)	3,030	1,285
2932.91.00	Isosafrole	10.7%	Free (A*,CA,E,IL,J,MX)	1,442	8
2932.92.00	1-(1,3-Benzodioxol-5-yl)propan-2-one	10.7%	Free (A*,CA,E,IL,J,MX)	0	0
2932.93.00	Piperonal (heliotropin)	4.8%	Free (A*,CA,E,IL,J,MX)	189	4,045
2932.94.00	Safrole	6.6%	Free (A*,CA,E,IL,J,MX)	648	0
3301.11.00	Essential oils of bergamot	Free		1,649	1,705
3301.12.00	Essential oils of orange	3.8%	Free (A*,CA,E,IL,J,MX)	17,708	26,516
3301.13.00	Essential oils of lemon	5.4%	Free (A+,CA,E,IL,J,MX)	13,557	34,224

See notes at end of table.

**Table 5—Continued**

**Flavor and fragrance materials: Harmonized Tariff Schedule subheading; description; U.S. col. 1 rate of duty as of Jan. 1, 1998; U.S. exports and imports, 1997**

HTS subheading	Description	Col. 1 rate of duty as of Jan. 1, 1998		U.S. exports, 1997	U.S. imports, 1997
		General	Special		
-Million dollars-					
3301.14.00	Essential oils of lime	Free		4,840	16,518
3301.19.10	Essential oils of grapefruit	3.8%	Free (A*,CA,E,IL,J,MX)	3,401	1,451
3301.19.50	Other essential oils of citrus fruit	Free		30,609	4,528
3301.21.00	Essential oils of geranium	Free		1,028	2,756
3301.22.00	Essential oils of jasmine	Free		39	1,170
3301.23.00	Essential oils of lavender or of lavandin	Free		1,226	8,454
3301.24.00	Essential oils of peppermint ( <i>Mentha piperita</i> )	5.0%	Free (A*,CA,E,IL,J,MX)	72,862	3,997
3301.25.00	Essential oils of mints other than peppermint	Free		64,236	12,220
3301.26.00	Essential oils of vetiver	Free		1,724	766
3301.29.10	Essential oils of eucalyptus	1.8%	Free (A*,CA,E,IL,J,MX)	616	2,591
3301.29.20	Essential oils of orris	1.1%	Free (A*,CA,E,IL,J,MX)	616	1,243
3301.29.50	Other essential oils	Free		31,868	116,845
3301.30.00	Resinoids	Free		14,694	4,129
3301.90.10	Extracted oleoresins	4.5%	Free (A*,CA,E,IL,J,MX)	15,792	26,336
3301.90.50	Other distillates or solutions of essential oils	Free		24,153	5,462
3302.10.10	Mixtures of odoriferous substances not containing alcohol	1.2%	Free (A*,CA,E,IL,J,MX)	75,552	70,071

See notes at end of table.



**Table 5—Continued**

**Flavor and fragrance materials: *Harmonized Tariff Schedule* subheading; description; U.S. col. 1 rate of duty as of Jan. 1, 1998; U.S. exports and imports, 1997**

HTS subheading	Description	Col. 1 rate of duty as of Jan. 1, 1998		U.S. exports, 1997	U.S. imports, 1997
		General	Special		
				-Million dollars-	
3302.10.20	Mixtures of odoriferous substances containing not over 20 percent of alcohol by weight	1.3 cents/kg + 0.6% <sup>2</sup>	Free (A*,CA,E,IL,J,MX) <sup>2</sup>	60,442	7,828
3302.10.30	Mixtures of odoriferous substances containing over 20 percent of alcohol by weight	1.3 cents/kg + 0.6% <sup>2</sup>	Free (A*,CA,E,IL,J,MX) <sup>2</sup>	75,552	0
3302.10.40	Mixtures of odoriferous substances containing over 20 but not over 50 percent of alcohol by weight (requiring only the addition of ethyl alcohol to produce a beverage for human consumption)	10 cents/kg + 2.3% <sup>2</sup>	Free (A*,CA,E,IL,J,MX) <sup>2</sup>	30,221	3,586
3302.10.50	Mixtures of odoriferous substances containing over 50 percent of alcohol by weight (requiring only the addition of ethyl alcohol to produce a beverage for human consumption)	20.2 cents/kg + 2.3% <sup>2</sup>	Free (A*,CA,E,IL,J,MX) <sup>2</sup>	30,221	2,668
3302.10.90	Mixtures of odoriferous substances containing over 20 percent of alcohol by weight, n.e.s.	1.3%	Free (A+,CA,E,IL,J,MX)	30,221	4,461
3302.90.10	Other mixtures of odoriferous substances containing not over 10 percent alcohol by weight	2 cents/kg + 0.8% <sup>2</sup>	Free (A*,CA,E,IL,J,MX) <sup>2</sup>	158,794	82,425
3302.90.20	Other mixtures of odoriferous substances containing over 10 percent alcohol by weight	2 cents/kg + 0.9% <sup>2</sup>	Free (A*,CA,E,IL,J,MX) <sup>2</sup>	105,863	3,831

<sup>1</sup> Programs under which special tariff treatment may be provided, and the corresponding symbols for such programs as they are indicated in the "Special" subcolumn, are as follows: Generalized System of Preferences (A, A\*, and A+); Automotive Products Trade Act (B); Agreement on Trade in Civil Aircraft (C); North American Free Trade Agreement - eligible goods of Canada (CA); Caribbean Basin Economic Recovery Act (E); United States-Israel Free Trade Area (IL); Andean Trade Preference Act (J); and North American Free Trade Agreement - eligible goods of Mexico (MX).

<sup>2</sup> Certain imports under this provision may be subject to a Federal Excise Tax (26 U.S.C. 5001) of \$13.50 per proof gallon and a proportionate tax at the like rate on all fractional parts of a proof gallon.

Source: U.S. exports and imports compiled from official statistics of the U.S. Department of Commerce.

**Table 6**  
**Flavor and fragrance materials: U.S. exports of domestic merchandise, by principal markets, 1993-97**

Source	1993	1994	1995	1996	1997
<i>Value (1,000 dollars)</i>					
Canada .....	111,306	127,991	150,916	166,623	178,187
Japan .....	132,739	162,055	154,784	174,168	126,495
Mexico .....	46,896	56,551	53,424	61,932	74,119
United Kingdom .....	40,741	48,639	52,209	63,442	64,331
France .....	33,550	35,792	39,138	37,597	51,397
Germany .....	24,604	31,374	30,546	32,442	44,500
Belgium .....	23,081	27,154	29,043	33,157	39,967
Hong Kong .....	19,326	26,427	34,162	32,306	37,657
Netherlands .....	22,488	31,765	36,803	37,876	36,917
Brazil .....	10,370	11,613	20,268	18,682	23,741
All Other .....	268,984	288,866	309,004	322,684	336,985
<b>Total .....</b>	<b>734,085</b>	<b>848,228</b>	<b>910,298</b>	<b>980,909</b>	<b>1,014,296</b>

Source: Compiled from official statistic of the U.S. Department of Commerce.

### *Foreign Trade Measures*

Tariffs on flavor and fragrance materials in most of our trading partners closely parallel U.S. tariffs, with most current rates ranging from free to approximately 7 percent. Although some rates exceed 10 percent, these are primarily applied to “mixtures of flavors that can be used with ethyl alcohol to produce a drink suitable for human consumption.” The pure natural materials, primarily oleoresins and essential oils, are typically free in nations where they are not available from domestic producers.

## **FOREIGN INDUSTRY PROFILE**

Major world producers of flavor and fragrance materials are located in Western Europe (France and Switzerland), the major trading nations of the Pacific Rim (Hong Kong, Singapore, Japan), and nations with the potential to develop major industries based on significant domestic natural resources (China, India, Brazil). The large multinational firms based in Western Europe and the United States, and to a lesser extent Japan, tend to dominate the industry, although the European firms tend to have more developed networks and infrastructures for supplying most of the world’s markets. For example, Haarman & Reimer, a subsidiary of Bayer AG (Germany), acquired a number of smaller firms (e.g., Florasynth (U.S.), and Creations Aromatiques (originally based in France and formerly owned by PFW, Inc., a U.S. firm)) during 1993-97 to improve their global production, marketing and distribution capabilities.<sup>36</sup> There also remains significant production of flavor and fragrance materials in and around major Asian seaport trading centers, such as Hong Kong and Singapore.

<sup>36</sup> “H&R Florasynth Combines with Creations Aromatiques,” *Chemical Market Reporter*, June 30, 1997, pp. 5 and 15.

In general, participants in the flavor and fragrances industry are seeking to expand across international boundaries both by acquisition and through development of new enterprises in both major markets and in areas where raw materials are available.<sup>37</sup> Several major multinational firms are planning on developing new production facilities in India over the next several years to serve the emerging Asia-Pacific market.<sup>38</sup> At the same time, these firms are also planning plant expansions in U.S. and European markets in anticipation of projected growth in demand for flavor and fragrance materials.<sup>39</sup>

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<sup>37</sup> "BBA Broadens Global Reach with Addition of Indian Plant," *Chemical Market Reporter*, Nov. 24, 1997, pp. 1 and 15; and "F&F Firms Solidify Positions with Spate of Expansion Moves," *Chemical Market Reporter*, Dec. 1, 1997, p. 16.

<sup>38</sup> "F&F Firms Solidify Positions with Spate of Expansion Moves," *Chemical Marketing Reporter*, Dec. 1, 1997, p. 16.

<sup>39</sup> *Ibid.*



**APPENDIX A**  
**TARIFF AND TRADE AGREEMENT**  
**TERMS**

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# TARIFF AND TRADE AGREEMENT TERMS

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In the *Harmonized Tariff Schedule of the United States* (HTS), chapters 1 through 97 cover all goods in trade and incorporate in the tariff nomenclature the internationally adopted Harmonized Commodity Description and Coding System through the 6-digit level of product description. Subordinate 8-digit product subdivisions, either enacted by Congress or proclaimed by the President, allow more narrowly applicable duty rates; 10-digit administrative statistical reporting numbers provide data of national interest. Chapters 98 and 99 contain special U.S. classifications and temporary rate provisions, respectively. The HTS replaced the *Tariff Schedules of the United States* (TSUS) effective January 1, 1989.

Duty rates in the *general* subcolumn of HTS column 1 are most-favored-nation (now referred to as normal trade relations) rates, many of which have been eliminated or are being reduced as concessions resulting from the Uruguay Round of Multilateral Trade Negotiations. Column 1-general duty rates apply to all countries except those listed in HTS general note 3(b) (Afghanistan, Cuba, Laos, North Korea, and Vietnam), which are subject to the statutory rates set forth in *column 2*. Specified goods from designated general-rate countries may be eligible for reduced rates of duty or for duty-free entry under one or more preferential tariff programs. Such tariff treatment is set forth in the *special* subcolumn of HTS rate of duty column 1 or in the general notes. If eligibility for special tariff rates is not claimed or established, goods are dutiable at column 1-general rates. The HTS does not enumerate those countries as to which a total or partial embargo has been declared.

The *Generalized System of Preferences* (GSP) affords nonreciprocal tariff preferences to developing countries to aid their economic development and to diversify and expand their production and exports. The U.S. GSP, enacted in title V of the Trade Act of 1974 for 10 years and extended several times thereafter, applies to merchandise imported on or after January 1, 1976 and before the close of June 30, 1999. Indicated by the symbol "A", "A\*", or "A+" in the special subcolumn, the GSP provides duty-free entry to eligible articles the product of and imported directly from designated beneficiary developing countries, as set forth in general note 4 to the HTS.

The *Caribbean Basin Economic Recovery Act* (CBERA) affords nonreciprocal tariff preferences to developing countries in the Caribbean Basin area to aid their economic development and to diversify and expand their production and exports. The CBERA, enacted in title II of Public Law 98-67, implemented by Presidential Proclamation 5133 of November 30, 1983, and amended by the Customs and Trade Act of 1990, applies to merchandise entered, or withdrawn from warehouse for consumption, on or after January 1, 1984. Indicated by the symbol "E" or "E\*" in the special subcolumn, the CBERA provides duty-free entry to eligible articles, and reduced-duty treatment to certain other articles, which are the product of and imported directly from designated countries, as set forth in general note 7 to the HTS.

Free rates of duty in the special subcolumn followed by the symbol "IL" are applicable to products of Israel under the *United States-Israel Free Trade Area Implementation Act* of 1985 (IFTA), as provided in general note 8 to the HTS.

Preferential nonreciprocal duty-free or reduced-duty treatment in the special subcolumn followed by the symbol "J" or "J\*" in parentheses is afforded to eligible articles the product of designated beneficiary countries under the *Andean Trade Preference Act* (ATPA), enacted as title II of Public Law 102-182 and implemented by Presidential Proclamation 6455 of July 2, 1992 (effective July 22, 1992), as set forth in general note 11 to the HTS.

Preferential free rates of duty in the special subcolumn followed by the symbol "CA" are applicable to eligible goods of Canada, and rates followed by the symbol "MX" are applicable to eligible goods of Mexico, under the *North American Free Trade Agreement*, as provided in general note 12 to the HTS and implemented effective January 1, 1994 by Presidential Proclamation 6641 of December 15, 1993. Goods must originate in the NAFTA region under rules set forth in general note 12(t) and meet other requirements of the note and applicable regulations.

Other special tariff treatment applies to particular *products of insular possessions* (general note 3(a)(iv)), *products of the West Bank and Gaza Strip* (general note 3(a)(v)), goods covered by the *Automotive Products Trade Act* (APTA) (general note 5) and the *Agreement on Trade in Civil Aircraft* (ATCA) (general note 6), *articles imported from freely associated states* (general note 10), *pharmaceutical products* (general note 13), and *intermediate chemicals for dyes* (general note 14).

The *General Agreement on Tariffs and Trade 1994* (GATT 1994), pursuant to the Agreement Establishing the World Trade Organization, is based upon the earlier GATT 1947 (61 Stat. (pt. 5) A58; 8 UST (pt. 2) 1786) as the primary multilateral system of disciplines and principles governing international trade. Signatories' obligations under both the 1994 and 1947 agreements focus upon most-favored-nation treatment, the maintenance of scheduled concession rates of duty, and national treatment for imported products; the GATT also provides the legal framework for customs valuation standards, "escape clause" (emergency) actions, antidumping and countervailing duties, dispute settlement, and other measures. The results of the Uruguay Round of multilateral tariff negotiations are set forth by way of separate schedules of concessions for each participating contracting party, with the U.S. schedule designated as Schedule XX. Pursuant to the Agreement on Textiles and Clothing (ATC) of the GATT 1994, member countries are phasing out restrictions on imports under the prior "Arrangement Regarding International Trade in Textiles" (known as the Multifiber Arrangement (MFA)). Under the MFA, which was a departure from GATT 1947 provisions, importing and exporting countries negotiated bilateral agreements limiting textile and apparel shipments, and importing countries could take unilateral action in the absence or violation of an agreement. Quantitative limits had been established on imported textiles and apparel of cotton, other vegetable fibers, wool, man-made fibers or silk blends in an effort to prevent or limit market disruption in the importing countries. The ATC establishes notification and safeguard procedures, along with other rules concerning the customs treatment of textile and apparel shipments, and calls for the eventual complete integration of this sector into the GATT 1994 over a ten-year period, or by Jan. 1, 2005.