The Search for New Aroma Chemicals*

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The search for new aroma chemicals is an ongoing program costing the industry millions of dollars every year. Even if a suitable molecule were found today, it probably would not be commercially available until the year 2000. Why the delay?

From the date of patent filing, approximately three to five years can elapse before a new patent globally clears all the regulatory, safety, process and production hurdles.

Then comes the difficult part in the life cycle of this new, patented aroma chemical. You have to get perfumers to use it. It is very important that this novel ingredient be incorporated quickly into a successful formula because a return is needed on the investment while the aroma chemical remains captive and protected by the patent.

Although we must have creative chemists looking for new molecules and searching nature for ingredients and inspiration, a possible alternative approach to "new" aroma chemicals is to re-examine our existing inventory of about 5,000 items. Here are a few examples of "new" aroma chemicals.

Find the Isomer

We know there are distinct odor differences demonstrated within various isomer groupings.

This was the motivation behind the investigation of **Hawthanol**[a] (Figure 1). This product is a mixture of three isomers. The ortho isomer was found to have the most attractive odor. It was synthesized and evaluated. The outcome—a "new" aroma chemical for IFF—has a distinctive green, dewy-floral odor reminiscent of peony. We know it as **Peomosa**.

Reposition

Consider **dimethyl cyclormol** (Figure 2), an aroma chemical that was originally developed as part of the wood-patchouli family. This chemical is now used as an important floralizer imparting a naturalness to fragrance blends (Table I).

Build on Change

One aroma chemical that has been around for a long time was described by Steffen Arctander over 30 years ago in volume 1 of his book *Perfume and Flavor Chemicals*. He describes entry 803 as having a "... very mild, sweet balsamic

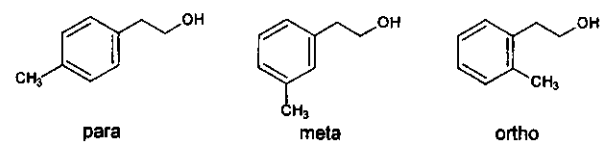

Figure 1. Hawthanol (the three isomers of methyl benzene ethanol)

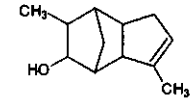

Figure 2. Dimethyl cyclormol

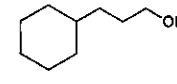

Figure 3. Cyclohexyl propanol

Table I. Dimethyl cyclormol demonstration formula

	With	Without
Benzophenone	2.50	2.50
Celestolide	2.00	2.00
Citronellol Coeur	18.00	18.00
Fragarone 10% BB	0.30	0.30
Galaxolide BB 50	14.00	14.00
Geosmin DPG**	1.00	1.00
Peomosa	10.00	10.00
Phenyl ethyl alcohol	22.00	22.00
Phenoxanol	20.00	20.00
Rose oxide	0.20	0.20
Dimethyl cyclormol	10.00	-
DPG	-	10.00
Total	**100.00**	**100.00**

**DPG is dipropylene glycol

*This article is adapted from the author's presentation on October 20, 1994, at the World Perfumery Congress in Scottsdale, Arizona.

[a]Hawthanol (ortho,meta,para-methyl benzene ethanol) is a registered tradename of IFF.

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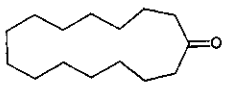

Figure 4. Musk 15 (cyclopentadecanone)

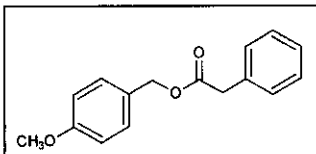

Figure 5. para-Anisyl phenyl acetate

but rather flat odor ... not been able to catch the interest of perfumers." The Arctander quote refers to **cyclohexyl propanol** (Figure 3).

Times and finished products change. In many modern bases the floral aldehydes are unstable, so alternatives are required. Now cyclohexyl propanol has a new lease on life as part of the stable muguet-floral complex used in detergent granules with bleach and bleach boosters (Table II).

Apply New Technologies from Biochemistry

Now we come to a material that has been with us for a long time, but is very expensive. A new biochemical manufacturing route has brought its price down dramatically and has opened up new uses previously excluded because of costs.

Musk 15[b] (Figure 4) is a musk with a sensual skin and hair tone. It has good substantivity and a musk ambrette-like nuance and is surprisingly stable in hypochlorite bleach.

[b]Musk 15 (cyclopentadecanone) is a registered tradename of IFF.

Table II. Cyclohexyl propanol demonstration formula

	With	Without
Acetyl iso eugenol	1.20	1.20
Allyl amyl glycolate	0.30	0.30
Canthoxal	0.80	0.80
Celestolide	12.00	12.00
Citral extra	0.40	0.40
Citronellol Coeur	5.50	5.50
γ-Decalactone	0.70	0.70
δ-Damascone	0.20	0.20
Galaxolide BB 50	12.00	12.00
Hedione	12.00	12.00
Helional	3.00	3.00
Heliotropine	0.40	0.40
Hexyl cinnamic aldehyde	3.50	3.50
Indolarome	0.20	0.20
Iso E Super	22.60	22.60
Maritima	0.70	0.70
Methyl anthranilate	0.20	0.20
Peomosa	6.00	6.00
Rose oxide 10% DPG**	0.40	0.40
Rosemary oil	0.30	0.30
Tagette oil	0.20	0.20
Tetrahydro muguol coeur	6.00	6.00
Triplal 10% DPG	0.70	0.70
Undecylenic aldehyde 10% DPG	0.30	0.30
Verdural B Extra 10% DPG	0.40	0.40
Cyclohexyl propanol	10.00	-
DPG	-	10.00
Total	**100.00**	**100.00**

**DPG is dipropylene glycol

Monitor Flavors

At IFF, we monitor our flavor division for ideas and ingredients. The following aroma chemical was obtained from this intra-company exchange.

Para-anisyl phenyl acetate (Figure 5) has a sweet, heliotrope-like, honey odor with good tenacity. It is very stable in talc. Although para-Anisyl phenyl acetate a has a very high boiling point, new distillation techniques produce a clean product free from off-notes normally associated with thermal degradation.

Summary

I hope these examples show that within our raw material palette, there are undiscovered winners.

It is our responsibility as perfumers to exploit the potential of what we have right under our noses.

Reference

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