

Interesting facts in our field.



Les mystères, Germaine Knecht 1976

Our Practical Findings about the Perception of Smelling Compounds

While our analytical department has established a library comprising more than 4'000 smelling compounds over the past years, our perfumers and flavourists are going through regular daily training of their noses.

2% ethanolic solutions of twelve different smelling compounds¹ are prepared by the laboratory staff and presented to the expert panel, numbered from 1 – 12, without names. The task consists of naming the compounds correctly, and also describe the odour with up to five characteristics, like "woody, floral, earthy, berry, green" etc., and possibly also a comparative remark, like "similar to linalol", etc.

While the scores² may differ depending upon the materials random-selected by the computer, the personal daily condition of the expert, the time of the day (early in the day usually leads to much better results than later in the afternoon) it is interesting that the odour characteristics given do not vary as much. As a matter of fact, our method of training has led to a very refined description of most smelling materials which we now also can use in the other way, like using the descriptors as key to the ingredients we may want to add to a certain composition.

Therefore, it seems to be true that (at least within a sociological or cultural area or populace) the description of smells follows general lines and does not differ very much individually. Octen-1-ol-3 smells "fatty, aldehydic, mushroom and lavender like" for most of the nose experts. cis-Jasmone is best described as "spicy, celery, dry" (and not so much, as the name and it's first natural source suggest, jasmin-like).

From this practical experience over many years we may conclude that most people are able to communicate in the world of fragrances and flavours by the use of descriptors rather precisely³. It does require a certain degree of training to use one's nose, and one's vocabulary, but experts will do well from a very early stage of communication.

Odour Thresholds and Anosmia

The relative intensity of individual chemical odorants and flavorants is a subject that daily confronts those involved in the creation of fragrances and flavors. The actual measurement of such intensities has largely been restricted to the determination of threshold values of "detection." This is the value determined by panelists at which the odor or flavor of a "pure" odorant can be detected. The measurement of threshold values is dependent on a number of factors: (a) experimental methodology, (b) screening of panelists for specific anosmia⁴, (c) experience of panelists, (d) purity of odor/flavor chemical, and (e) sex and age makeup of panel and (f) the media in which the odorant is evaluated.

It is generally accepted that women are more sensitive to odors than men. This statistically seems to be confirmed by The National Geographic Smell Survey conducted in late 1986⁵. Age of respondents also appears to play a major role in acuity, with definite decreases occurring past age 50.

General anosmia to all odors is relatively rare (0.2%). However, there are specific anosmias to individual odiferous compounds that are wide spread. In particular, the "urinous" odor of 5-alpha-androst-16-en-3-one showed 47% of respondents as being anosmic while the "malty" odor of isobutyraldehyde showed 36% anosmics and the nature identical musk omega-cyclopentadecanolid (also known as Thibetolide or Exaltolide), 12% anosmics. A more complete review of this appeared in *Perfumer & Flavorist*⁶.

- 1 Out of the more than 4000 smelling compounds a fragrance and flavour company utilizes about 1000 on a more regular bases. The rest (about. 3000) are mostly either very similar to other compounds already present in the group of 1000 selected for preferential use, or very exotic, or rare and scarce or not dependable in supply. Therefore, in our procedure, we use a computer generated random choice of 12 compounds out of a designated group of 1000 regularly used by our creative team.
- 2 One point for a full hit, ½ point for a close hit (member of a group with very similar odour characteristics), i.e. maximum score 12 (out of 12).
- 3 Of course, what the individual senses when smelling a certain substance is something quite different. The olfactory nerve system leads directly to the limbic system in the brain which is the center of feelings and emotions. Since these are very individual there must be differences in the translation of smelling impulses. Besides, there is a more philosophical question, also: Who really knows what another person senses when it describes an odour as, e.g. "dusty"?
- 4 Anosmia is the medical term that refers to ones inability to smell a certain odor.
- 5 C.J. Wysocki et al., *Ann. New York Acad. Sci.* 561, 12-28 (1989, abstracted from reference 6.
- 6 J.C. Leffingwell et al, *Perfumer & Flavorist* 16 (1), 1-19 (1991)