



A new concept for controlled (burst or sustained) release of aromas in food applications

During 2008-2009 YKI has developed of a concept for controlled delivery and release of a class of chemical compounds which may have great potential in pharmaceutical and fragrance release applications. The concept may also be useful in food applications.

The concept can be viewed upon as a pro-aroma concept, where a water soluble, storage-stabile, and odourless pro-aroma controllably starts to break down to the desired aroma compound when dissolved in water. Depending on the odour threshold of the aroma compound, aroma release from the product could be detected already after mixing with cold water (for aroma compounds with low odour threshold/ for high concentrations of added pro-aroma) or as a burst release effect upon boiling or microwave heating of the product after dissolution or mixing with water.

In the case of room temperature applications, the aroma release will last for 20-100 days (half life of pro-aroma) depending on variables like pH and actual temperature, whereas for boiling applications the release will be immediate and decay on the order of minutes.

A limitation in the concept is that the released aroma compound must have a ketone functional group in its chemical structure, and the pro-aroma molecule itself may not be approved as a food additive today. However, at least in boiling applications (burst release), the pro-aroma compound will not be present in significant amounts after boiling on the order of minutes.

Ketone aromas are commonly used as food additives today, and Table 1 below lists some examples, together with the organoleptic response for each compound.

Table 1.

Ketone	Aroma (organoleptic response)
2-octanone*	Bitter/Camphoraceous/Cheese-like
Acetophenone*	Cherry/Grape/Jasmine
2-decanone*	Orange / floral
6-methyl-5-hepten-2-one*	Citrus
Anisylacetone*	Fruity/raspberry
Raspberr ketone, 4-hydroxy phenyl-2-butanone*	Fruity/sweet/raspberry/balsamine
2-heptanone**	Fruity, spicy – responsible for the “peppery” aroma inRoquefort cheese
3-mercapto 2-butanone*	Onion
2-nonanone*	Rose/tea
3-octen-2-one*	Earthy, fruity blueberry note
Damascenone*	Rose

*) Used in or on food according to the database “Kemiska Ämnen” (<http://kemi.prevent.se>)

**) Naturally found in cheese, nectarines, nuts, bread, and chicken muscle (<http://www.atsdr.cdc.gov/toxprofiles/phs44.html>)

A patent has been filed on the technology, covering several areas of use, including release of drugs, fragrances, aromas and insect repellents, and YKIs desire is now to sell or licence the technology to relevant partners.

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