



Oct-2-en-4-one

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The history of attempts made using chemical structures to predict odor is strewn with bright ideas followed by puzzling disappointments. Perhaps no category of flavor chemicals highlights this better than the series of unsaturated octenones. Having used five members of this small family at various times over the years, this author finds the differences in odor between such closely related chemicals startling.

Oct-3-en-2-one (FEMA# 3416, CAS# 1669-44-9) is quintessentially nutty in character and is widely used in nut flavors to very good effect. Oct-4-en-2-one (CAS# 33665-27-9) has a good black tea aroma and has only been used, to this author's knowledge, on an experimental basis. Oct-1-en-3-one (FEMA# 3515, CAS# 4312-99-6) is surprisingly characteristic of cooked mushrooms, with a slight earthy tinge in the background—therefore finding moderate use in mushroom and related flavors. Oct-4-en-3-one (FEMA# 4328, CAS# 14129-48-7) is basically berry-like in character and recently has found some use in raspberry flavors.

In stark contrast to these octenols, oct-2-en-4-one (FEMA# 3603, CAS# 4643-27-0) evokes strawberry jam with astonishing accuracy and is used in a wide range of strawberry flavors. It has a modest odor similarity to ethyl methyl phenyl glycidate (FEMA# 2444, CAS# 77-83-8) but is much more powerful and much closer to the true character of strawberries.

Despite the fact that the character of oct-2-en-4-one resembles strawberry jam rather than fresh strawberries, it functions in flavors as a strawberry note rather than a jammy or cooked note, and is entirely at home in fresh flavor profiles. Also, interestingly, by simply



adding fresh notes, oct-2-en-4-one's specifically strawberry note is tied firmly to the profile of fresh strawberries.

Although this chemical possesses such an instantly recognizable, natural strawberry profile, it can be used to good effect in many other flavor profiles. The suggested use levels given throughout this article are for flavors intended to be dosed at 0.05%, in ready-to-drink beverages or simple bouillon.

Berry Flavors

Strawberry: The vast majority of this raw material's use is probably in strawberry flavors. Its scent is so characteristic of strawberries that there is a powerful temptation to not just overdose it, but to do so considerably. The best use level in authentic-style, fresh strawberry flavors is likely in the region of 20 ppm. Higher levels could be used but may not work as well since it would produce a flavor that revolves around this single ingredient rather than integrating it into a natural profile.

Raspberry: Most people would not want a raspberry flavor that tastes like strawberry, which probably deters flavorists from adding this ingredient to raspberry flavors. This probably would be the case if 20 ppm of oct-2-en-4-one were added, but at much lower levels around 2 ppm this ingredient enhances the natural impression of raspberry flavors without detracting from them.

Blackberry: Two ppm of this ingredient has a very similar effect in blackberry flavors, essentially making the flavor taste more natural but not intruding into the profile.

Cranberry: Two ppm of this raw material is also quite effective in cranberry flavors. At this level, oct-2-en-4-one serves to enhance the juicy notes and deepen the profile.

Cherry: It is probably not worth even the small added cost of adding a trace quantity of oct-2-en-4-one to simplistic cherry flavors, although more authentic flavors can definitely benefit from a subtle addition of around 1 ppm.

Blackcurrant: The same sentiments are equally true for blackcurrant flavors. More natural-tasting blackcurrant flavors, which have slowly been gaining market share, can make good use of additions of around 1 ppm, although related buchu oil-based flavors will not benefit from this ingredient.

Tropical Fruit Flavors

Watermelon: Really authentic watermelon flavors are a distinct exception rather than the rule. This is, in part, attributable to familiarity with old-style flavors but in many applications, truly accurate flavors tend to taste far too thin. As a consequence, most flavors on the market try to broaden their profiles as far as possible without completely turning them into tutti-frutti, non-entities. This ingredient can be very useful in this context, and 10 ppm is the ideal level of addition.

Guava: The opposite is true of guava flavors. Care must be exercised when adding oct-2-en-4-one to guava flavors because they naturally contain more than a few components in common with strawberry flavors. In this case, 2 ppm

is a good level and adds juice notes and depth without changing the profile.

Pineapple: In a similar way, pineapple flavors also have many components in common with strawberry flavors. Therefore, care must be taken so as not to alter the profile in the direction of strawberry. Two ppm works well, adding depth and authenticity.

Mango: Additional levels for this ingredient to mango flavors vary, depending on the profile of the flavor. Two ppm is a good starting point but higher levels can be used to good effect where the terpene “mango skin” note is emphasized.

Passion fruit: Only a trace of oct-2-en-4-one is needed in passion fruit flavors; 1 ppm is a good starting point. The effect may only be subtle, especially in very catty flavors, but it does add a degree of realism.

Other Fruit Flavors

Grape: Oct-2-en-4-one is tailor-made for grape flavors, which all too often seem dominated by anthranilates and are in absolutely no danger of morphing into strawberry flavors. Ten ppm

is a good starting point, adding notably attractive juice notes and depth.

Peach and apricot: Both peach and apricot flavors can benefit from a modest addition of this ingredient, around 4 ppm, increasing the depth and complexity of both profiles and adding welcome juiciness.

Other Flavors

Honey: At first sight, oct-2-en-4-one would seem firmly anchored for use within the realm of fruit flavors but this is not entirely true. A trace of around 1 ppm can be very effective in honey flavors, helping to prevent the profile from becoming too floral.

Cheddar cheese: Finally, the best aged Cheddar cheeses have a slightly fruity note, and this ingredient can introduce something of that character without diminishing the dominant cheese profile. Levels of addition can vary depending on the desired effect but 1 ppm is a good place to start.

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