

Constituents contributing to the “sweet smell” and “burnt smell” in sake exhibited at the Annual Japan Sake Awards
(*Zenkoku Shinshu Kanpyokai*)

A “sweet caramel-like smell” or “burnt smell” is observed in ~10% of the premium (*ginjo*) sake exhibited at the Annual Japan Sake Awards ((*Zenkoku Shinshu Kanpyokai*); hereafter, it is referred to as exhibited sake). The overall evaluation of exhibited sake with indication of the abovementioned smell, corresponding to off-flavors, was not satisfactory, and constituents contributing to this smell were not known. Hence, these constituents were screened so as to increase the quality of premium (*ginjo*) sake.

From GC-olfactometry analysis, furaneol and homofuraneol were identified as constituents exhibiting sweet smell. In addition, comprehensive volatile component analysis revealed several constituents contained at higher level in sake with sweet or burnt smell. These candidate substances were quantitatively analyzed, and sake emitting such smell contained homofuraneol, dimethyl trisulfide, and 1,1-diethoxyethane, at concentrations greater than the threshold values. In addition, when the candidate substances were added to exhibited sake in which no sweet and burnt smells was observed, the intensity of the sweet and burnt smell tended to increase. From these results, several constituents, such as homofuraneol, are considered to contribute to the sweet and burnt smells in exhibited sake.

Constituents contributing to the “sweet smell” and “burnt smell” in premium sake were identified.

Constituents contributing to the “sweet smell” and “burnt smell” in sake exhibited at the Annual Japan Sake Awards

- Indication of a “sweet caramel-like smell” or “burnt smell” in ~10% of premium (*ginjo*) sake presented to the Annual Japan Sake Awards.
- If these smells are observed, overall evaluation is not satisfactory.



Screening of constituents contributing to a “sweet smell” or “burnt smell” in sake

1. Screening using GC-olfactometry

Screening of smells close to a “sweet smell” or “burnt smell.”

2. Screening by comprehensive analysis

Screening of constituents contained at higher level in sake exhibiting a “sweet smell” or burnt smell.”

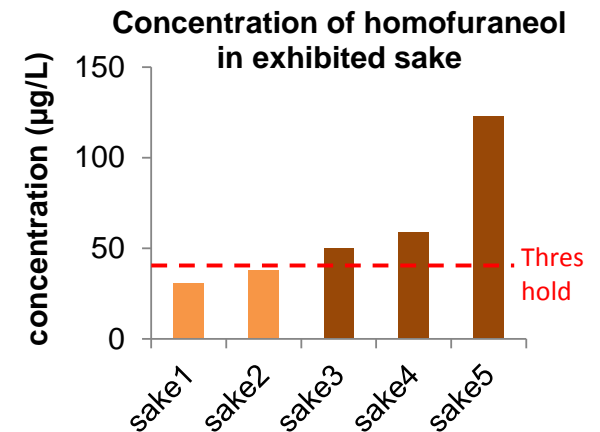
Furaneol, homofuraneol, aldehydes, acetals, and sulfur compounds were identified as candidate compounds

3. Quantitative analysis of candidate constituents

Concentrations of homofuraneol, dimethyl trisulfide, and 1,1-diethoxyethane in sake exceeded the threshold values.

4. Sensory evaluation

After adding the candidate constituents to control sake, which does not exhibit a “sweet smell” or “burnt smell,” the intensity of “burnt smell” increased, and although not significantly different, the intensity of the sweet smell also increased.



sake1,2 : exhibited sake without sweet or burnt smell
sake3-5 : exhibited sake with sweet or burnt smell

Several constituents, e.g., homofuraneol, supposedly contributed to the “sweet smell” and “burnt smell.”