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Problem

The musty taint, also called 'cork taint', is not the only undesirable flavor, but is the most frequent one, introduced in wine by natural cork.

For the 'classical' cases, the principal causative agent for this disagreeable flavor is **2,4,6-trichloroanisole (TCA)** [1] and this at very low concentrations.

5 ng/l in white wine are sufficient!

Solution ? Replace the cork ?

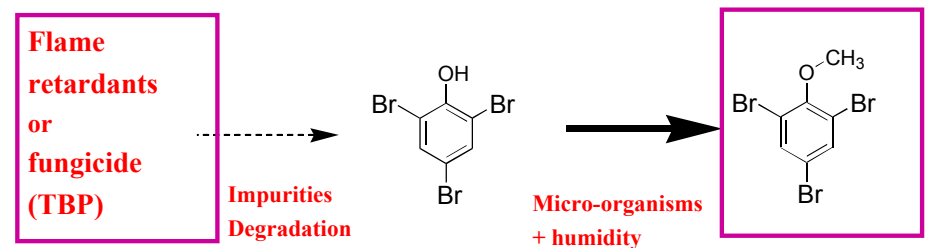


Replacing the cork stopper by a screw cap or plastic stopper is thought to be the most efficient solution to this problem. But even then sometimes mustiness in the wine is observed and, after analysis, it was found that TCA is not the involved.

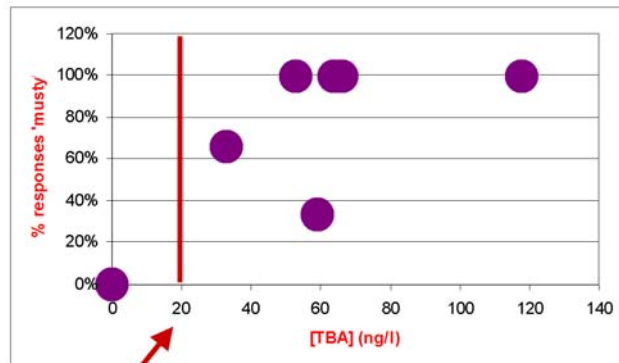
So what is it ? The Big brother of TCA : 2,4,6-tribromoanisole (TBA)

Where does TBA come from ?

The origins of TBA are for the moment not well known. The last step is a methylation of tribromophenol by micro-organisms. TBA is then, most probably, transferred to the screw caps either during transport or stocking. [2]



Detection and Quantification of TBA



Sensory detection limit

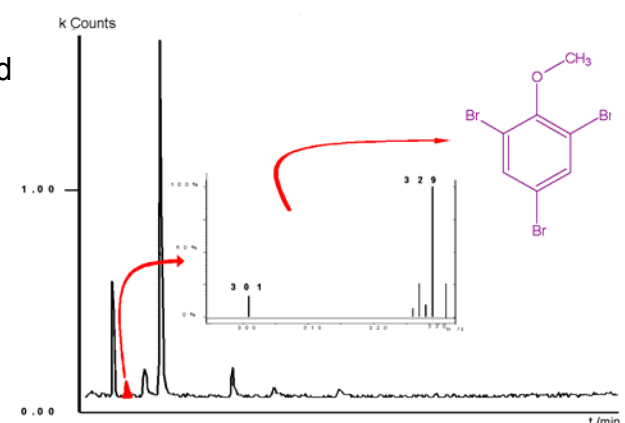
A) Sensory analysis

The first and easiest way to detect TBA is the nose. The sensory detection limit was determined to be about 20 ng/l in white wine.

B) Chemical analysis using GC/MSMS

As the concentration of TBA is at trace level, a very sensitive and selective analytical method is needed.

The proposed method uses GC-MS in an MSMS detection mode, preceded by an SPME (Solid Phase Micro Extraction) sample concentration.



| Samples | Cork taint (degustation) | Remarks (degustation) | [TCA] [ng/l] | [TBA] [ng/l] |
|---------|--------------------------|----------------------------|--------------|--------------|
| 5 | 100 % | Cork / quercus | n.d. | 66 |
| 9 | 100 % | Mustiness / cork | n.d. | 53 |
| 12 | 66 % | Sechard / cork | n.d. | 33 |
| 15 | 100 % | Mustiness / cork / quercus | n.d. | 64 |
| 18 | 100 % | Mustiness / cork / quercus | n.d. | 120 |
| 19 | 33 % | cork | n.d. | 59 |
| 22 | 33 % | cork | n.d. | n.d. |
| others | 0 % | — | n.d. | n.d. |

A real case (see table) showed that about **20% of the bottles presented a musty taste**. Chemical analysis showed that the causative agent was **not TCA but TBA**.

However many cases will never be detected, as normally wine bottles with screw stoppers are first: **never presented for tasting** and secondly, **'can not be cork-tainted'**.

[1] H Tanner, C. Zannier, H.R. Buser, *Schweizerische Zeitschrift für Obst-und Weinbau*. **1981**, 117, 97-103.
[2] F.B. Whitfield, J.L. Hill, K.J. Shaw, *J. Agric. Food Chem.* **1997**, 45, 889-893. (and refs therein)

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