



**General Meeting
of Performance BIB**
Nîmes, France
25 to 27 November 2007



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2007**

Session : Monday 26 November 2007 at 9:30
Measurement techniques for flavour scalping and
gas permeability

Title : **AWRI methods for evaluating**
- flavour scalping and taints and
- oxygen ingress in bottles

Speaker : Mai Nygaard, Group Manager,
Analytical Service, AWRI, Australia



Presentation overview

- Evaluation of packaging materials
-flavour scalping and taint assessment
- New AWRI method for measuring oxygen
ingress in bottles
- Contamination of wine during transport
-experiences from AWRI

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Evaluation of wine contact materials

- “Tainting” trial to determine any sensory impact of a packaging material/liner.
 - trained sensory panel
- “Scalping” trial to determine what, if any, effect the material has on a series of aroma chemicals.
 - GC MS analysis

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Tainting trial

- Wine contact surface area of 5 x and 50 x normal standard contact area in real life application
- Wine samples and control wine stored at ambient temperature for 1 month
- Sensory evaluation by trained panel
Duo-trio difference test
 - Min 25 tasters, blind tasting using standardised sensory evaluation procedures
 - One sample is labelled 'reference'-tasters instructed to select the wine which is considered to be the same based on aroma and/or palate

Statistical significance

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Scalping trial

- Wine is spiked with a mixture of aroma components (Dr Mark Sefton).
 - naphthalene, cis/trans rose oxide, ethyl -hexanoate, -octanoate and -decanoate, damascenone and β -ionone. (500 ppb ethyl alkanoates and 100 ppb others)
- Control wine, spiked control wine and spiked wine added contact material (5 x and 50 x contact surface area) is stored for 1 month
- GC-MS analysis of aroma components at time zero and after one month

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Oxygen ingress; AWRI's BPAA method

- New method developed to evaluate oxygen ingress (OTR) in bottles
- Uses two reagents in model wine
 - bis-9,10-anthracene-(4-trimethylphenylammonium) dichloride (**BPAA**) as an oxygen trap
 - methylene blue and light as a sensitizer (to convert oxygen from triplet to singlet state)

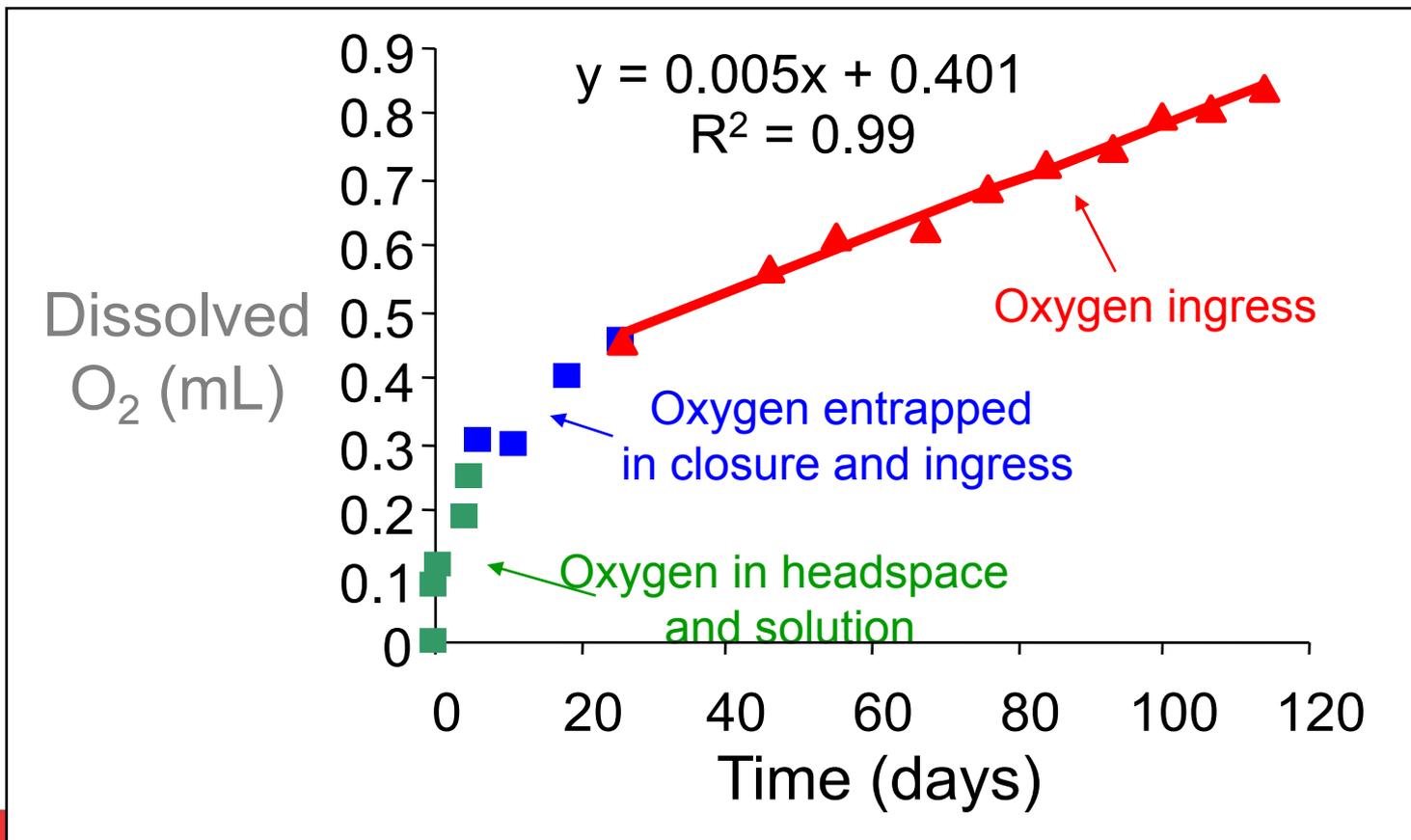
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BPAA show three phases of oxygen ingress



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Oxygen ingress summary

BPAA method can estimate

- Oxygen permeation rates
PLUS
- Oxygen pickup at bottling
- Oxygen entrapped in the closure

This tool takes us closer to our goal of predicting and optimizing wine development in bottle

We need

- Consistent closures with low or controllable OTRs
- Consistent low oxygen pickup at bottling

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Contaminations of wine - experiences from AWRI

- Assisting the Australian wine industry
- Recent years, serious cases of contaminations linked to additives and transportation problems
- A range of taint compounds identified in Australian and imported wines.
Examples are halophenols, haloanisoles, naphtalene
- More information AWRI annual report 2006

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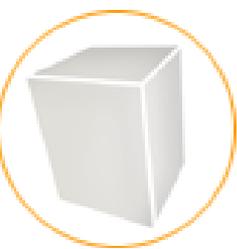
Chlorophenols

- Potent synthetic chemicals, active ingredients in wood preservatives, fungicides and general biocides
- Global environment
 - universal use as wood preservatives over several decades. Also in paper, fiberboard and adhesives.

Bromophenols

- Flame retardants and fungicide
- Widely used to treat wood and wood products

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Containers fitted with timber floors are frequently implicated in the contamination of non-hermetically sealed food, raw materials and empty packaging materials

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Container contaminations

- Timber floors can be deliberately treated with preservatives (chlorophenols, bromophenols)
- Microbial methylation of halophenols leads to haloanisoles (TCA, TBA) eg. by fungi present in timber, fibreboard and paper
- Accidentally contaminated by spilled chemicals (aromatic hydrocarbons?)

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