

## **Fast Manometric Method for Determining the Effective Oxygen Diffusion Coefficient Through Wine Stopper**

Julie Chanut

*PAM UMR 02 102, Agrosup Dijon, Dijon, France*

Jean-Marc Simon <sup>C, S</sup> and Jean-Pierre Bellat

*Chemistry, ICB, University of Bourgogne Franche-Comte, Dijon, France*

*jmsimon@u-bourgogne.fr*

Thomas Karbowski

*PAM UMR 02 102, Agrosup Dijon, Dijon, France*

A fast manometric method has been designed for determining the oxygen transfer rate through cork stoppers. Thanks to this technique, it is possible to measure the effective diffusion coefficient of oxygen through a thin cork wafer in a few days, whereas months are required in the case of a full-length cork stopper. A calculation method has also been developed and validated to extrapolate the effective oxygen diffusion coefficient measured on thin wafers to a full-length stopper, based on the statistical analysis of the experimental data distribution. The question of the material heterogeneity and the representative thickness is addressed as well as the effective length of the stopper beyond which the gain in resistance to mass transfer becomes non-significant [1].

### References

[1] J. Chanut, A. Lagorce, S. Lequin, R. D. Gougeon, J.-M. Simon, J.-P. Bellat, T. Karbowski, *Polymer testing* 93, 106924 (2021)