

Optimization of a tool to determine the oxygen avidity of a wine through the kinetics of consumption by its phenolic and aromatic fractions

Marioli Alejandra Carrasco-Quiroz, Rosario Sanchez-Gomez, Ignacio Nevares, Ana Martinez-Gil, Víctor Martínez-Martínez, María del Alamo-Sanza*
UVaMOX-Group, Universidad de Valladolid, Avda. Madrid, 50, 34004 Palencia, Spain

*maria.alamo.sanza@uva.es

INTRODUCTION AND OBJECTIVE

Wine oxidation phenomena during the different processes of winemaking, aging and storage are closely related to the presence of oxygen and to the wine's capacity for consumption. Grape composition will be directly related to wine composition, defining the O₂ consumption rate, with particular importance of phenolic compounds and metal ions content. The prediction of the O₂ consumption capacity of a wine could be a great tool to help in decision making during the winemaking process.

Optimization of the reactivation of phenolic and aromatic fractions of grapes (PAFs) for the study of their avidity to consume oxygen. Study of the effect of alcohol, pH, acetaldehyde and the metals Fe, Cu and Mn.

RESULTS

The parameters defining the kinetics of consumption allowed us to differentiate the different types of grapes. The greatest discriminatory capacity were the parameters related to the amount of oxygen consumed and the time invested in consuming this amount of oxygen, especially in the first stages. PAFs with lower antioxidant capacity, IPT, IC and higher L presented the highest amount of oxygen, however this consuming less oxygen quantity.

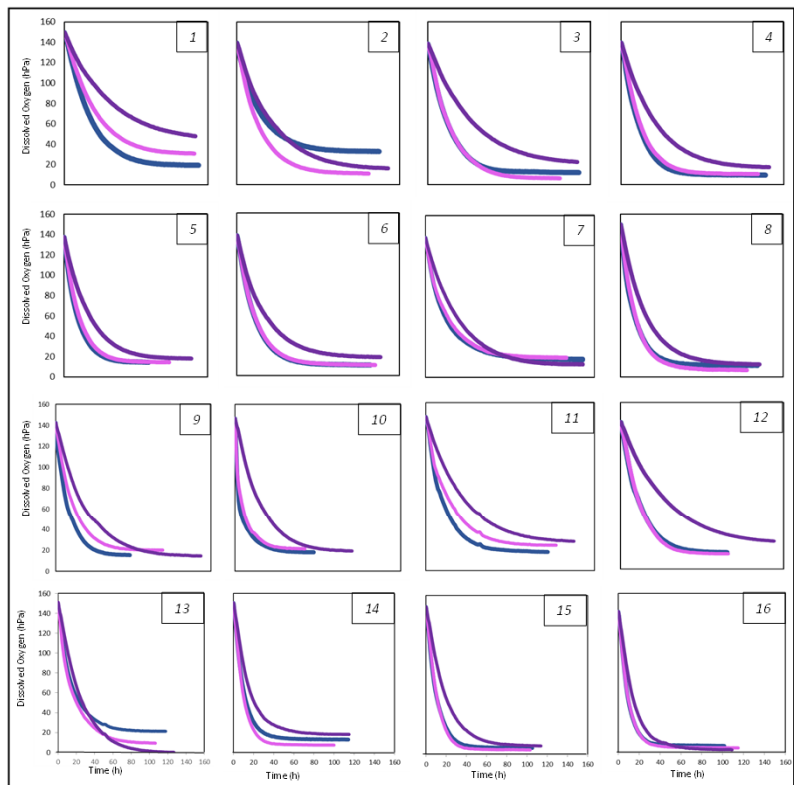
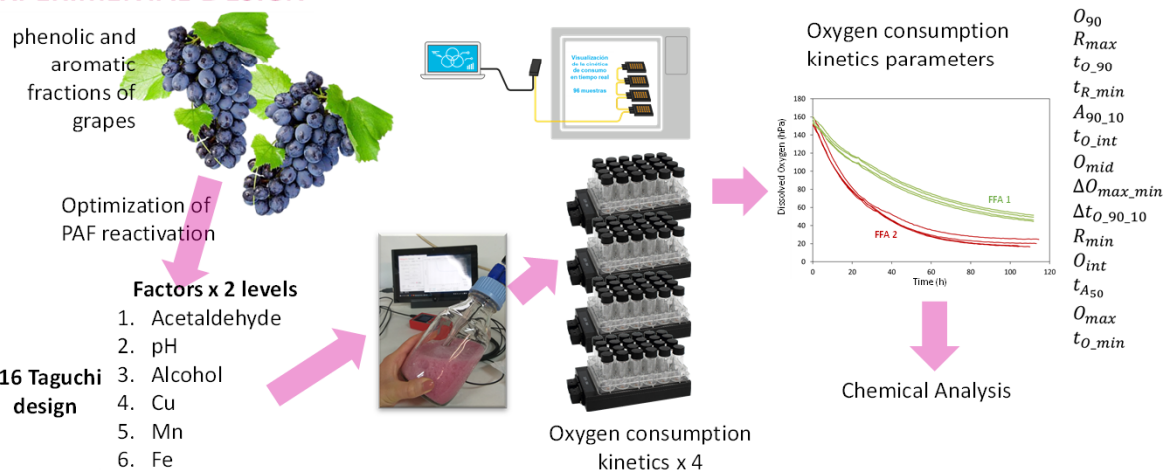


Fig 1. Oxygen consumption kinetics by PFA in 16 different reactivation conditions

EXPERIMENTAL DESIGN



RESULTS

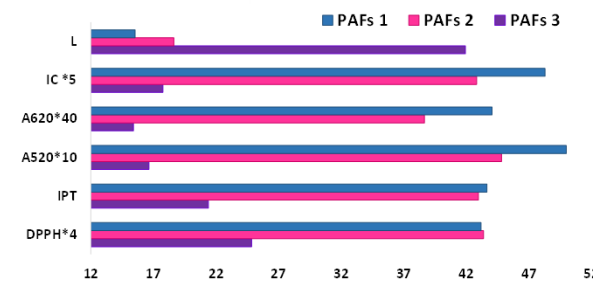


Fig 2. Chemical analysis with reactivation conditions of the different PFAs

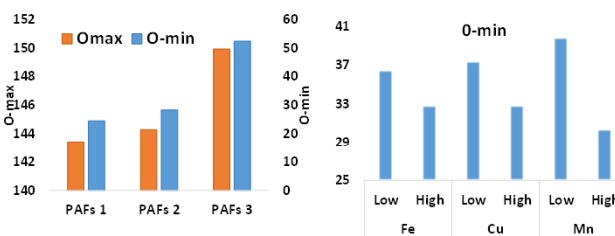


Fig 4. Parameters of oxygen content with different PFAs and reactivation conditions

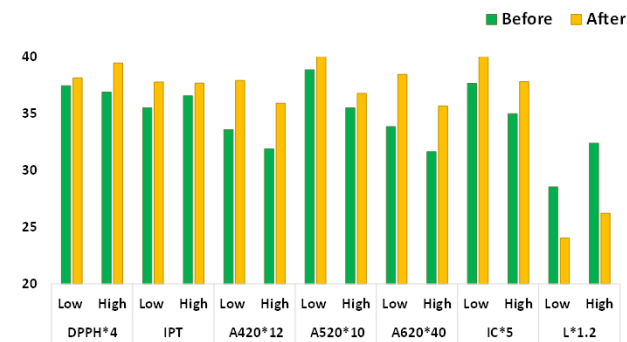


Fig 3. PFAs with high or low reactivation Mn levels. Chemical analysis before and after oxygen consumption.

The different reactivation conditions have an influence on the chemical composition before receiving oxygen and after consuming it. For example, the reactivation with lower concentration of Mn, in general, presented higher results in the chemical characteristics. The wines presented higher values of the chemical characteristics after oxygen consumption.

CONCLUSIONS

The best activation conditions of phenolic and aromatic fractions have been established for the evaluation of different PAFs by developing their oxygen consumption kinetics.

ACKNOWLEDGMENTS



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