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Wine Tartaric Stabilization by Electrodialysis: Prediction of Required Deionization Degree

Patrícia A.M.H. Soares¹, Vítor Geraldês^{1,*},
Cristina Fernandes¹, Paulo Cameira dos Santos² and
Maria Norberta de Pinho¹

¹ Technical University of Lisbon, Instituto Superior Técnico, Department of Chemical and Biological Engineering, Av. Rovisco Pais, 1, 1049-001 Lisbon, Portugal; and ² INRB, L-INIA, Quinta do Marquês, 2784-505 Oeiras, Portugal.

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* Corresponding author (email: viktor.geraldês@ist.utl.pt; tel: +351218417511; fax: +351218499242)

The development of electrodialysis as a robust technology for wine tartaric stabilization relies on the minicontact test for predicting the deionization degree (DD) required to stabilize wine. Our objective was to quantify the influence of the key parameters of the minicontact test (run time and seeding potassium hydrogen tartrate [KHT] crystal granulometry) on predicted DD and to evaluate the tartaric stability of wines by the freezer test, the long-term storage test, and saturation temperature. Electrodialysis experiments were performed in a bench-scale apparatus using white, rose, red, and fortified wines in batch mode. Deionization degree varied from 0 to 30%. The minicontact test was performed for a maximum run time of 65 hr, using KHT crystals with two different particle size distributions. The tartaric stability of the raw and partially deionized wines was assessed by the freezer test and by saturation temperature. The minicontact test predicts a DD required for stabilizing the wine that is strongly dependent on run time and is also influenced by KHT crystal granulometry. This test can predict an accurate DD that ensures the tartaric stability of the electrodialysis-treated wine, provided that the run time is adjusted empirically for each type of wine. Results show that it is necessary to use KHT with a controlled size distribution in order to improve the repeatability of the minicontact test. The freezer test with no prefiltration exhibited a good repeatability for the different wines, and the wines that passed this test were stable in a 6-month storage test at a temperature of 6°C.

Key words: wine, tartaric stability, saturation temperature, minicontact test, freezer test