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Quality Management of Wines and Redox Processes

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Abstract

Wine is a dynamic system whose redox balance evolves throughout production and maturation. One of the main factors regulating the balance of this system is the presence of oxygen; the redox potential makes it possible to measure the level of oxidation or reduction of this system at any stage of evolution. Oxygen can alter the composition and quality of must and wine by participating directly or indirectly in different chemical or biochemical reactions. Phenolic compounds in wine are generally highly reactive with oxygen and potentiate its action. This reactivity, amplified by the presence of redox metal couples strongly influences the formation or disappearance of the components of aromas and taste of wines. The excess, as well as the oxygen deficiency, may be the origin of the evolution of the organoleptic characteristics of the wine, depending on the nature and quantity of the newly formed or degraded products. Thus, wine management includes as an essential component the continuous supervision of redox processes, which can directly influence its quality. The article analyzes the redox processes that lead to changes in the quality of the wine, as well as the markers of these processes.