THERMODYNAMIC AND KINETIC STUDIES OF POTASSIUM BITARTRATE SEDIMENTATION INTO YOUNG WINES DURING THE COLD STABILIZATION

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Generally, the solubility of potassium bitartrate (KHT) is dependent primarily upon the: alcohol content, pH, the temperature of the storage, the presence of colloids, etc. [1]. In young wines, KHT is always present in supersaturating concentrations and crystallizes spontaneously. The cooling technique of young wines has found commercial application [2].

Investigations have been conducted on two young wines *Chardonnay* and *Pinot Noir* varieties of vintage 2014. Data obtained of physic-chemical analyses of the wine were used to calculate: the thermodynamic and the Arrhenius parameters of the process according to the methodology proposed in literature [3].

Based on thermodynamics, negative $\Delta G°$ and $\Delta H°$ values and positive $\Delta S°$ values give a spontaneous process at lower temperatures with an easier KHT precipitation. The value of kinetics parameters decreases with increasing temperature treatments, the heat factor and of composition have a decisive influence on the reaction rate.

The results show that the precipitation reaction of KHT in wine is characterized through a medium activation energy and a high frequency factor, which explains the significant rate reaction of these compounds in young white and red wines. In addition, the studied reaction is not limited to the diffusion factors, but those kinetics.

References:

1. Boiret M. Et autres. *Indice de stabilite tartrique des vins et risque de precipitation*. *Rev. Fr. Oenol.*, 1991, 128, 53–58.

2. Maujean, A. *Traitement par le froid artificiel des vins en relation avec leur stabilisation vis-à-vis des troubles cristallins tartriques*. In Les acquisitions récents dans les traitments physiques du vin. Paris: Ed Lavoisier Tec & Doc., 1994, 81-101.

3. A. Zarrouk L. and autres. *Int. J. Electrochem. Sci*., 2011, 6, 6261 – 6274.