

## **POSSIBILITY AND NECESSITY OF TARTARIC ACID PRODUCTION IN THE REPUBLIC OF MOLDOVA**

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The wine industry has been and remains a source of natural tartaric acid. However, the use of wine wastes was limited in the Republic of Moldova by tartaric lime and wine stone production, being exported to Ukraine and Armenia. Tartaric acid is used in considerable quantities in the winemaking and food industry, being an expensive imported product. Nowadays, about 43% of wine companies capitalize on wine by-products in the Republic of Moldova. More than 66% of them process less than half of the total amount of by-products generated.

The Department of Oenology and Chemistry has developed a complete technological scheme for wine waste use to obtain tartaric acid.

For tartaric lime obtaining, a conventional method is proposed. Drinking water at room temperature is mixed with the solid-type tartaric raw material (in the case of liquid material, the washing step is unnecessary). The diffusion juice of raw material is mixed with CaCO<sub>3</sub> introduced to the mixing chamber. Treatment can be repeated several times in the same vessel to accumulate calcium tartrate. Then, the tartaric lime is washed with water, dried, and transferred to the tartaric acid production plant. The washed pomace can be used for further seed separation or as an addition to animal feed, compost, and others.

The Department of Oenology and Chemistry staff suggests electro dialysis for Ca<sup>2+</sup> cation separation, purification, and concentration of the tartaric acid solution. Under the action of electric current, cations will be separated from the semi-permeable membrane with a positive charge, while the anions of tartaric acid from the semi-permeable membrane with a negative charge. The use of electro dialysis, except the purification of tartaric acid, will reduce energy costs when concentrating the tartaric acid solution by evaporation.

The production of tartaric acid from wine waste is possible without significant investments and can solve economic, social, and ecological issues. Pomace, yeast, wine stone, and vinasse are the primary wine wastes from which tartaric acid can be produced, and for every one million dal of wine produced, 50-80 tons of acid can be obtained. It is necessary to exclude the usage of aggressive and expensive reagents to solve ecological issues when processing wine wastes, so electro dialysis implementation is recommended for the purification and concentration of tartaric acid solutions.

**Keywords:** *tartaric acid, calcium tartrate, winemaking, circular bioeconomy, vinasse, wine stone.*

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