

Nano Tech for Better Wine

2023-05-22

A new 'smart surface' has been shown to successfully remove unwanted sulfur aromas from wine, opening up new opportunities for Australian winemakers.

Developed by scientists from Australian Wine Research Institute (AWRI) and [Flinders University](#), the technology is based on applying a thin plasma polymer coating to a surface and then immobilising nanoparticles on that surface, which then bind strongly to sulfur compounds in wine.

Trials of the new surface, recently published in the journal [npj Science of Food](#), removed up to 45% of free hydrogen sulfide from wine and the treatment was also effective at removing more complex sulfur compounds, such as methanethiol.

"A key benefit of the new approach is that it is easily deployable and retrievable. Essentially there's a one-step process where the smart surface is added directly to the wine and then removed after a certain time period," says AWRI Principal Research Scientist, Dr Agnieszka Mierczynska-Vasilev.

Since the nanoengineered surfaces developed are independent of the substrate material, there is also potential for them to be applied to various relevant wine equipment such as filtration devices, aerators, decanters, packaging materials or closures.

Co-author of the study, Matthew Flinders Professor Krasimir Vasilev, says the Biomedical Nano-engineering Laboratory at Flinders University was instrumental in delivering the "breakthrough technology to improve winemaking" in collaboration with AWRI experts.

Professor Vasilev and AWRI colleagues have also published in [Food Chemistry](#) on a novel solution to tartrate instability in white wines.

Volatile sulfur compounds (VSCs) are a group of compounds that contribute significantly to wine aroma. While some contribute positive varietal characters, others are associated with negative 'reductive' aromas such as 'rotten egg', 'rubber' and 'canned corn'. The management of these off-aromas is a significant cost for the wine sector.

The new smart surface has been shown to outperform the traditional winemaking treatment of copper sulfate addition commonly used to avoid unwanted volatile sulfur compounds. In addition, unlike copper sulfate, it does not cause any negative effects on flavour.

The next steps in the development of the smart surfaces for deployment in the wine sector are currently being explored.

The study was funded by Wine [Australia](#) and in-kind support from Flinders University.

Read the [original article](#) on Flinders University.