Sulfur Dioxide Quantification: Improvements to the Classical Ripper Titration Using Colorimetric Analysis

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Free sulfur dioxide, which preserves wine, is usually measured via an iodometric “Ripper” titration, where color change signifies the endpoint. However, most such methods are either inefficient or inaccessible to small wineries, and when safety and palatability of wine are at stake, improving methods for quantifying it is paramount. This experiment modified the method for maximum efficiency and affordability, and devised how to test wine storage safety over time. After creating a starch-iodine indicator and plotting a calibration curve, sulfur dioxide concentration was calculated by mixing the wine and indicator, retracing the amount of sulfur dioxide from the absorbance, then measuring the concentration as the wine oxidated over 15 days to see how oxidation would affect the measurement. The initial concentration (0.000206M(±3.58%)) was lower than the hypothesized one (0.000273M), but overall the method had a 94.1% yield and 5.94% error compared to the previous 60% error, showing this method’s accuracy. For measuring wine oxidation, sources of interference, such as ascorbic acid, were evaluated. This method uses very little wine (2ml) compared to the Ripper titration (50ml), reducing waste while producing results in under a minute. This study showed that the improved method was highly efficient at rapidly quantifying sulfur dioxide in white wines, and highlighted issues for measuring oxidative spoilage, which will be addressed in further research, giving a promising lead into streamlining oenology.

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