# DYNAMIC LIGHT SCATTERING

## A PROMISING TOOL FOR BENTONITE CHARACTERIZATION

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**Figure 1: Haze formation in wine**

## Introduction

The appearance of turbidity in white and rosé wine is a serious visual fault in winemaking, lowering the commercial value of wine (**Figure 1**). A major cause of turbidity formation is the presence of proteins. To prevent haze formation, proteins are removed before bottling through adsorption onto bentonite. However, bentonite may adversely affect wine quality by aroma loss and color alteration. Therefore, it is pertinent to use the right quantity and quality of bentonite. In this context, Dynamic Light Scattering (DLS) represents a promising approach to characterize the quality of bentonite.

## Aims

- **Characterize commercial bentonites by Dynamic Light Scattering for size and zeta potential.**
- **Correlate zeta potential with the capacity to precipitate proteins from model wine solutions.**

## Dynamic Light Scattering

DLS was applied as a non-invasive technique to measure size and size distribution of particles in the submicron region (**Figure 2**). DLS combined with an electric field enables measuring the zeta potential of bentonites (**Figure 3**). Zeta potential represents the force of the electrostatic interactions between particles.

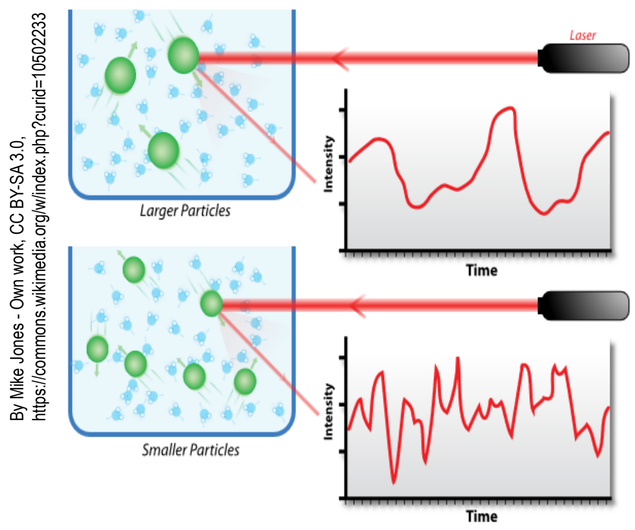


**Figure 2: Larger particles generate higher scattering intensity.**

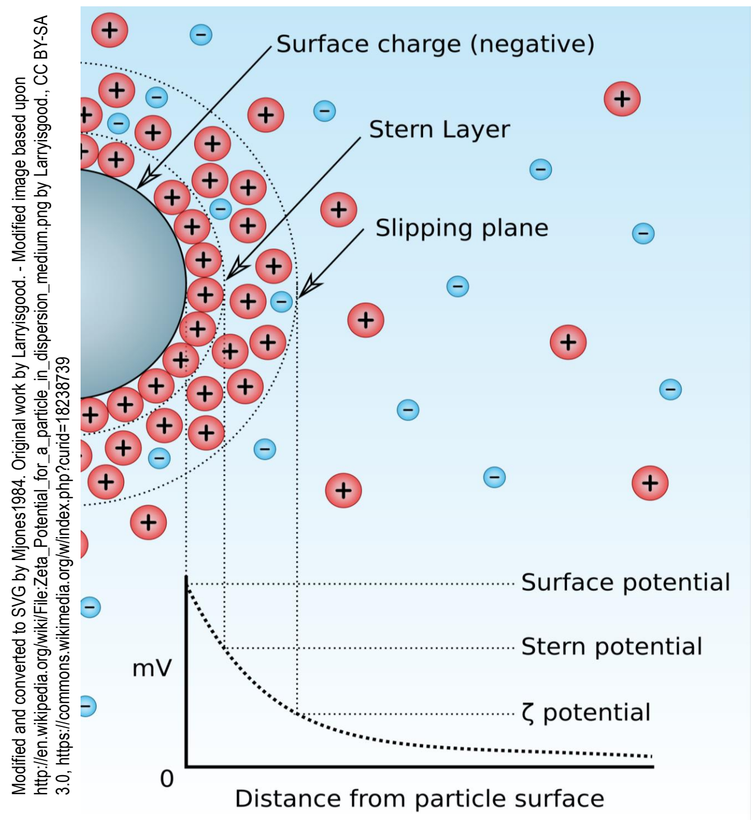


**Figure 3 : Explanation of zeta potential**

## Experimental

Bentonites were characterized with DLS for their size and charge. Model wines containing 20, 40 and 80 g/hL protein were used to assess bentonites' capacity to eliminate proteins.

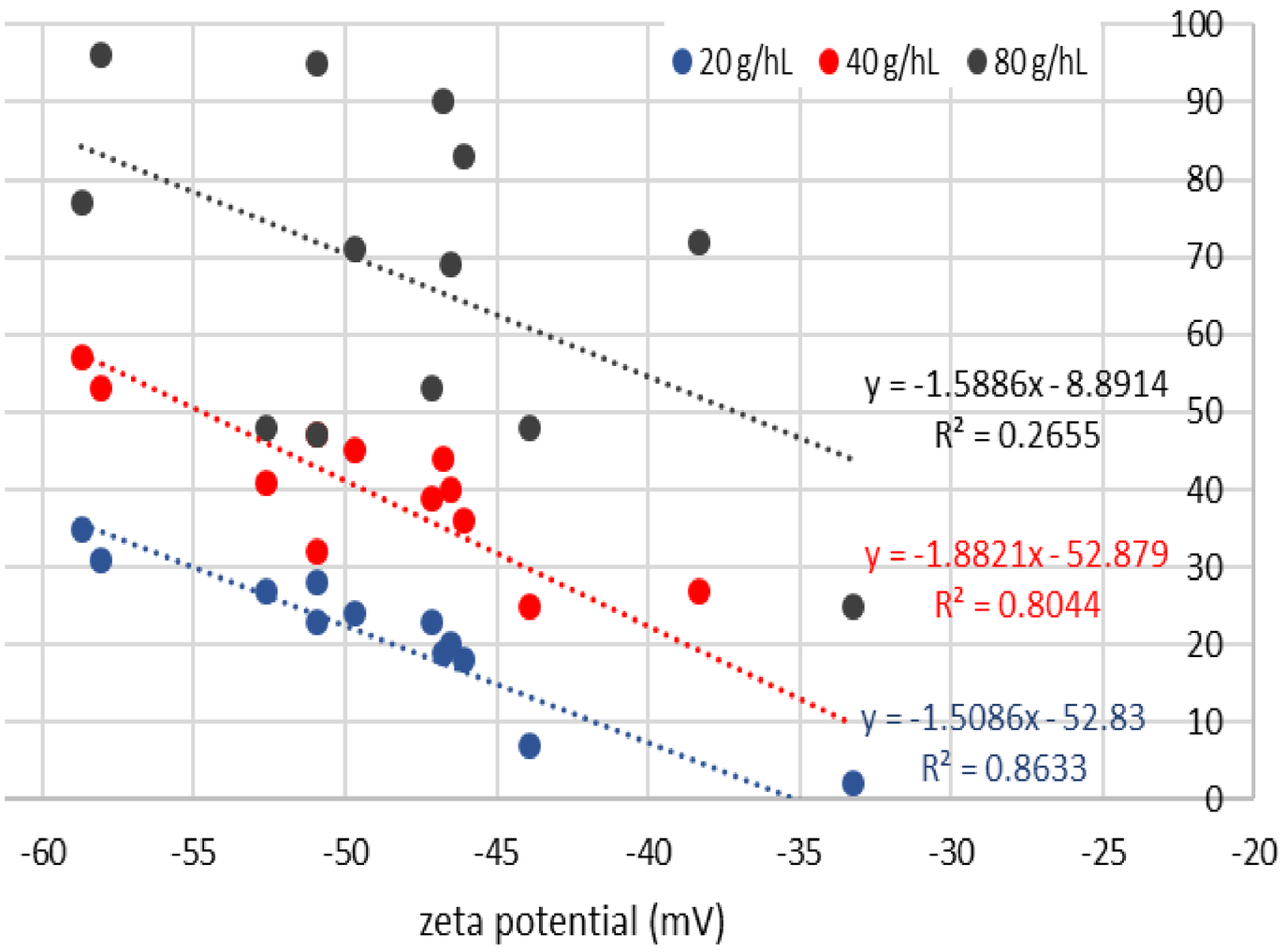


**Figure 4 : Correlation of zeta potential and protein elimination from model wines by bentonites**

## Results

Zeta potentials of commercial bentonites and their capacity to eliminate proteins from model wines correlate well for lower protein concentrations (**Figure 4**).

Currently the efficacy of bentonite to precipitate proteins from real wine samples is investigated to prove a correlation with the zeta potential. Obtained results for 20 white and rosé wines are encouraging. Due to the complex matrix of wines, more analyses will be done for a final method validation.

## Conclusion

Zeta potential measurements by DLS enables bentonite characterization for its capacity to eliminate haze forming proteins from wines.

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