

Advancing Sunscreen Studies with non dilution and fast Zeta potential

Introduction/Context

Controlling zeta potential is crucial for sunscreen sprays, as it affects particle stability and dispersibility. Maintaining an optimal zeta potential prevents aggregation, ensuring even skin coverage, improved stability, and effective sun protection. This enhances product quality, reliability, and consumer safety. Besides the zeta potential, polyelectrolyte (PE) titration to find the zero point of charge (zeta potential = 0) is another important parameter as it determines charge density, total charges, the number of active ingredients, and the type of charge in cosmetic samples.

Importance of Zeta Potential in Sunscreen Spray:

- Higher zeta potential values generally indicate better stability of the sample.
- The skin's zeta potential is around -20 mV, so maintaining an optimal range for cosmetics is essential:
 - **Positive Zeta Potential:** the product may be hard to wash off the skin.
 - **Negative Zeta Potential:** If too negative, the product may not adhere well to the skin.

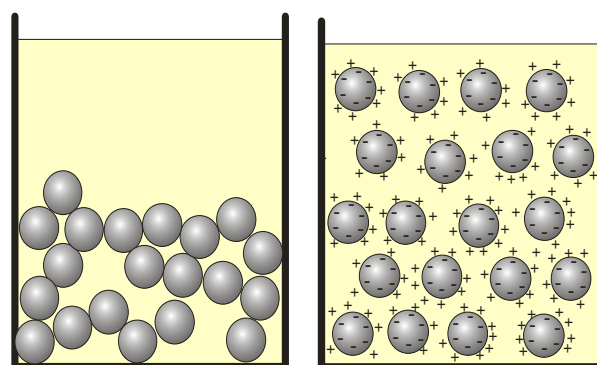


Figure 1: Samples without zeta potential sediment quickly, while those with high zeta potential stay suspended longer.

In this application note, we demonstrate the use of zeta potential and polyelectrolyte titration to monitor the destabilization of cosmetic samples. Specifically, we analyzed sunscreen sprays of the same brand with different expiration dates by measuring their zeta potential and performing polyelectrolyte titration to determine charge concentration. A correlation between these two