

Surfactants in agrochemicals

Product: SITA pro line t15+, SITA science line t100
Industry: Agricultural chemicals
Measuring principle: Measuring the dynamic surface tension

Agriculturally used chemicals such as pesticides, growth regulators, fertilizers and feed additives consist of a variety of active ingredients and additives. Active ingredients that specifically target harmful organisms and plants are among the most important components. Additives such as surfactants are used to

- specifically reduce the surface tension of spray solutions and to adjust the sprayability and to
- improve the wetting behaviour and the adhesion to the plant leaf surfaces.



Figure 1: Spray application in agriculture

Surfactants thus contribute to the homogeneous distribution of the active ingredients, to the increase in the absorption of the active ingredient and to the yield of the working solutions. This makes it possible to use a smaller quantity of pesticides, which contributes to lower costs in agricultural production and environmental benefits.

● Dynamic Surface Tension

The dynamic measurement of the surface tension via bubble pressure tensiometry displays the wetting behaviour of the surfactants on the sheet surfaces. Particularly short contact times, as they occur during spray processes, are the focus of the investigations. During the measurement, an air bubble is formed in the surfactant-containing liquid via a capillary. The surface-active agents are deposited on this new surface. The higher the concentration on the surfactant, the lower the measured surface tension. The dynamic measurement is able to determine the wetting time via the surface age

(measuring parameter bubble lifetime): from highly dynamic 15 milliseconds to 100 seconds.

Especially the comparison of the dynamic surface tension of different surfactant additives or concentrations in the **auto mode** of the laboratory tensiometers SITA pro line t15+ and science line t100 supports the selection of the optimal product formulation.

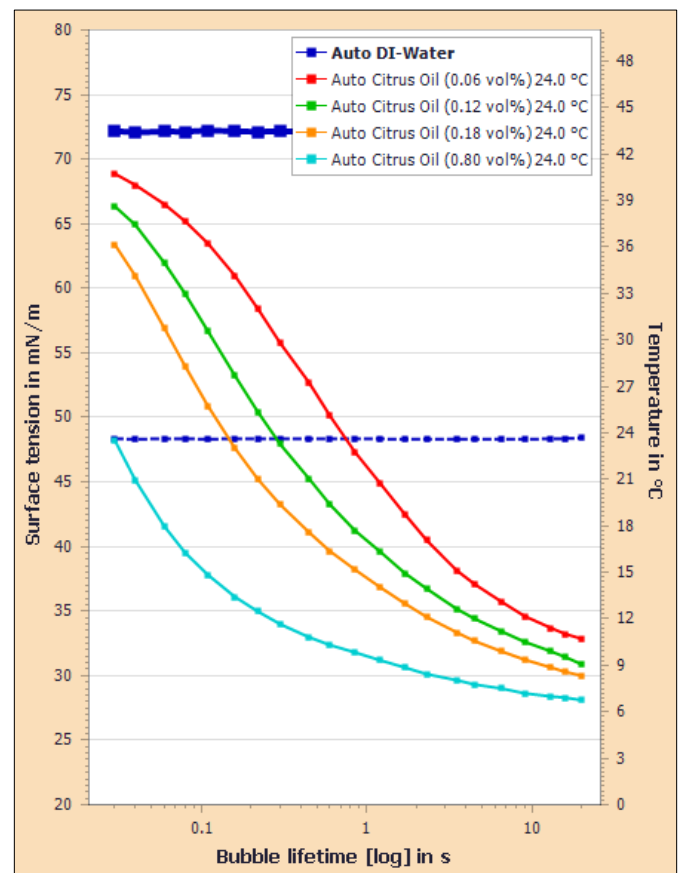


Figure 2: Auto measurements of the dynamic surface tension of a surfactant in four concentrations

The temperature behaviour of the surfactant's wettability has an important role in agricultural applications. Using the laboratory software SITA LabSolution the tensiometers can be combined with dosing systems and thermostats to automatically determine the dynamic surface tension at different temperatures and times.