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Agriculture and Food Industry Alliance

Process Measurement Technology for the Beverage Industry

Quality assurance in beverage production includes regular measurement of the carbon dioxide, alcohol, or sugar content during production.

In the future, an online-capable sensor based on ATR spectroscopy is expected to permanently measure these values – without the detour via a laboratory. Alcoholic fermentation involves a complex biological breakdown of carbohydrates into alcohol and carbon dioxide.

How and when exactly this breakdown takes place is important for the quality of the beer. During the production of beer, but also wine, spirits, and non-alcoholic beverages, samples are therefore taken regularly and analyzed in the lab.

Measurements directly in the process simplify fermentation monitoring.

Inline systems for liquid analysis measure density, noise, turbidity, or the optical refraction index of the liquid in order to draw conclusions about important variables such as extract, alcohol, or original wort through calibration and comparison with stored lab comparison data.

For the new liquid sensor, the researchers rely on ATR spectroscopy in the mid-infrared range.

Measuring a quasi-continuous spectral range in combination with chemometric evaluation methods makes it possible to separate spectrally overlapping components (e.g., different sugars, ethanol).

The compact detectors operate maintenance-free without mechanical parts and are integrated into a hermetically sealed sensor head.

A challenge is posed by the harsh conditions in beverage production: high temperature and pressure fluctuations, noise, or vibrations.

Suitable miniaturized sensor technology ensures that these influencing factors are measured in order to correct possible measurement errors.

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For further information, please follow the QR code.