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Calibration-free moisture content sensor and related methods

A calibration-free moisture content sensor utilizing electrochemical impedance spectroscopy offers a prompt, reliable, and highly accurate means for real-time moisture content monitoring across multiple industries, requiring minimal to zero calibration.

Researchers at Purdue University have developed a calibration-free moisture content sensor for pharmaceutical applications. By leveraging electrochemical impedance spectroscopy (EIS), this technology enables accurate and rapid testing of moisture content in pharmaceutical materials. Current methods for moisture content measurement of pharmaceutical powders require extensive calibration, which is time-intensive and results in low producibility. The sensor developed by Purdue instead requires minimal to zero calibration and offers a prompt, reliable means for real-time moisture content monitoring. Moreover, applications for the sensor extend beyond pharmaceuticals, offering benefits for the food, energy, environmental, and healthcare industries.

Technology Validation:

By combining the frequency spectrum information, equivalent circuit indices, and material characteristics as inputs, the proposed sensor achieved exceptional predictive accuracy, with an average error as low as 0.69%.

Advantages:

-Facilities a quicker and more accurate moisture content determination

-Requires minimal to zero calibration

-Applicable to a wide range of industries

-Promotes expedited product development

Applications:

-Pharmaceutical powders

Technology ID

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Category

Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation

Pharmaceuticals/Pharmaceutical Manufacturing & Methods

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-Moisture content analysis

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