

Pre-concentrated Tablets For Use As A Calibration Standard In Karl Fischer Titration

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ABSTRACT

Purpose: Currently, Karl Fischer calibration requires accurately weighing bulk powders and drawing liquid samples for water content analysis by skilled analytical personnel. This procedure is time consuming and has a high chance of error during standard preparation, delivery to the titration vessel, and exposure to ambient conditions. An alternative for calibration would be a single use, prepackaged tablet with defined water content. The proposed tablets are expected to have consistency in water content and the convenience of a pre-prepared unit dose standard.

Method: Tablets with water contents of 2 mg, 5 mg, 10 mg, and 25 mg were packaged into single use pouches. Water content was measured using volumetric titration in a typical reagent/methanol system.

Results: For each of the water strength standards (2, 5, 10, and 25 mg), three batches were prepared. The water content was analyzed over two months at an interval of 15 days. High batch-to-batch consistency and reproducibility was found along with significant repeatability between individual batches. The overall variation for individual batches at different time intervals was observed to be less than 2% for each of the tablet strengths. Additionally, the prepared tablets were added to the vessel without weighing and sample results were observed to have water content significantly comparable to results using conventional standards when weighed by difference.

Conclusion: Pre-concentrated tablets may be used as an alternative standard for Karl Fischer titration. The water content is repeatable over a period of time, and the consistency and accuracy is comparable to existing standards. Since the tablets do not require individual preparation and may be used without weighing, faster more simplified calibrations can be performed. The wide range of the water strengths may be used for a variety of applications including general volumetric, coulometric, pharmaceutical, food, and nutraceutical titrations.

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