


## Original Paper

# Development of Four Parabens Reference Materials Certified for Purity Mass Fraction by Mass Balance Approach

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## Abstract

The need for pure organic reference materials for establishing traceability to the international system of units, validation of analytical methods and assuring quality of the measurement results has been increased recently. Mass balance approach was used for development of four reference materials from methyl, ethyl, propyl and butylparaben certified for purity mass fraction. The analyte mass fraction in each reference material was assigned by measurements of detectable impurity components include determination of organic, inorganic, water and volatile impurities by HPLC–DAD and GC–FID, IC, Karl Fisher and headspace, respectively. Assignment of certified purity was based on results from independent liquid and gas chromatographic methods. The certified purity values of methyl, ethyl, propyl, and butylparaben and their corresponding expanded uncertainties ( $k = 2.0$ ) were found ( $998.48 \pm 0.71$ ), ( $997.80 \pm 1.36$ ), ( $998.20 \pm 0.51$ ) and ( $998.35 \pm 0.89$ ) mg/g, respectively. The prepared reference materials can be used as a measurement standard for analytical instruments and as a control sample for assuring quality of cosmetics, pharmaceutical and food products.

## Keywords

Parabens; Value assignment; Mass balance approach; Reference materials