

## Abstract

Research Title : Development of Lime Powder in use for Spray-Drying Technology  
Authors : Thanida Chuacharoen, Ph.D., Piyada Wongwiwat, Ph.D.  
Year : 2017

Lime powder was developed with 20% a combined maltodextrin and gum Arabic in a ratio at 4:1. A high shear homogenization was applied to encapsulate phytochemical compounds before spray drying process with the purpose of protecting bioactive compounds from thermal degradation. The effect of high shear homogenization on physicochemical properties and antioxidant activity of spray-dried lime powder was studied. This research investigated the changes of particle size, morphology, moisture content, color, solubility, hygroscopicity, ascorbic acid, total polyphenol and flavonoid contents, and antioxidant activity of spray-dried lime powder by comparing with lime powder without homogenization as a control. The higher yield (85%) was found in homogenized lime powder compared with control (76%). The average particle size of the homogenized powder was 0.1-4 micrometers, smaller than 18-26 micrometers of untreated powder. Morphological study revealed that without homogenization the powder had bigger sized particles with densely packed. Moisture content ranged between 3.91% and 5.42%. Higher solubility and less hygroscopicity values and also acceptable color after spray drying were observed in reconstituted lime powder with high shear homogenization. Folin-Ciocalteu and aluminum trichloride ( $AlCl_3$ ) method were used to determine total phenolic compounds and total flavonoid compounds, respectively. 2,2-diphenyl picryl hydrazide (DPPH) scavenging activity was used to determine antioxidant activity of lime powders. The ascorbic acid, total phenolic and flavonoid contents, and antioxidant activity were higher in the homogenized lime powder and significantly different between the homogenized and untreated powders except in total flavonoid content. The antioxidant activity derived from total phytochemical compounds in the powders was protected before spray drying. This study indicated that applying drying agent combined with high shear homogenization could prevent phytochemical compounds from thermal degradation during spray drying.