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Effect of sodium metabisulfite pretreatment on micrographs, surface roughness and X-ray diffraction analyses of solar dried potato cylinders

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Abstract

Most food industries perceive the significance of microscopy-based approaches to optimize existing drying processes to improve and control characteristics in dried food products. In this work, pretreated potato cylinders of 50 mm length and varying diameters of 8, 10 and 13 mm were dried in a mixed-mode solar dryer. Effect of pretreatment on surface properties of dried samples was investigated by scanning electron microscopy (SEM), atomic force microscopy (AFM) and X-ray diffraction (XRD) analysis. Microstructural analysis showed more porous and firm structure of pretreated samples. AFM images revealed the closeness of pretreated samples with raw sample. Lower values of skewness (0.084 ± 0.15 ; -0.840 ± 0.28) and kurtosis (2.243 ± 0.81 ; 3.550 ± 0.99) in case of cross-sectional and surface analysis of pretreated dried samples indicated smooth and undamaged surface. The degree of crystallinity and relative crystallinity of pretreated samples are overestimated in the range of 39.96-117.82% and 38.88-117.85% respectively.

Industrial relevance: This research is focused on studying the effect of pretreatment on surface and microstructural properties of solar dried potato cylinders. These properties will help in understanding the quality changes during drying and hence will be essential for enabling better

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