

Selim, K; M. Tsimidou, C. and G. Biliaderis (2000). Kinetic studies of degradation of saffron carotenoids encapsulated in amorphous polymer matrices, *Food Chemistry*, Volume 71, Issue 2, November 2000, Pages 199-206

Abstract

Kinetic studies on degradation of saffron water soluble carotenoids (mainly crocins) encapsulated in three different amorphous matrices (pullulan and two polyvinylpyrrolidone, PVP, samples differing in their molecular weight) were carried out at different water activity (a_w) conditions (0.43, 0.53, 0.64 and 0.75) in the dark at 35°C. Degradation of the polar pigments was monitored by periodic measurements of the coloring strength. Among the polymeric matrices used as wall materials, which largely decreased the oxidation rates of crocetin glycosides, PVP 40 was the most effective carrier under all storage conditions. In the vicinity of the glass transition temperature (T_g) zone, where pullulan and PVP360 undergo state transformations, there was a change in the reaction rate. The lower degradation rates were observed for PVP40 under conditions where this matrix was fully plasticized (i.e. rubbery) and “collapsed”, implying that the degradation kinetics are not governed by factors related to the physical state and molecular mobility of the inert matrix. Carotenoid losses have been observed even at temperatures below the T_g of the polymeric matrices.

Author Keywords: Saffron; Crocins; Degradation; Encapsulation; Glass transition temperature