

Effect of plasticizers on the physico-mechanical properties of pullulan based pharmaceutical oral films

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© 2016 Elsevier B.V. The effect of different plasticizers (glycerol, vitamin E TPGS and triacetin) and their concentrations on the physico-mechanical properties of pullulan based oral films was studied. A full factorial (32) design of experiments was used. Elastic modulus, tensile strength, elongation at break and disintegration time were selected as response variables. Modulated differential scanning calorimeter (MDSC) was used for determining glass transition temperature (T_g) of pullulan films. The surface morphology of films was evaluated by SEM, while ATR-FTIR was used to obtain a molecular level understanding of polymer-plasticizer interactions. The DoE analysis allowed for the modelling of tensile strength and elongation at break. The highest elongations were observed in glycerol at 20% w/w. Majority of the films disintegrated within one minute without significant differences. ATR-FTIR spectra of pullulan alone and different plasticizer blend films show characteristic molecular in