Synthesis and molecular weight and structural determinations of (polyvinylpyrrolidone)-oximate-silico-benzoyl glycine copolymer with IR and NMR spectroscopy

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Abstract: Polyvinylpyrrolidone (PVP)-oximate-silico-benzoyl glycine (POSBG) copolymer has been prepared taking PVP and benzoyl glycine with tetraethylorthosilicate as binder. Average viscosity molecular weights (M̄v) each of PVP-oxime and POSBG were determined with dilute aqueous solutions. For molecular weights primarily a calibration curve between intrinsic viscosities [η] and different molecular weights of polyvinyl alcohol (marker) has been obtained to determine M̄v, of oxime as 42,042 g mol-1. Similarly the M̄v of POSBG as 80,297.13 g mol-1 was determined with [η] of lysozyme (molecular weight = 24,000 g mol-1) egg albumin (40,000 g mol-1) and BSA (65,000 g mol-1). For structural illustration, IR spectra of PVP-oxime and copolymer were recorded in Nujol, which do not depict band frequency of -OH group of binder. The 1602, 1688, 1182, and 1127 cm-1 stretching vibration frequencies noted in spectra infer presence of -C=N, -C=O, -Si-O-Si-, and -Si-O-C- groups, respectively, in POSBG. Structures of PVP-oxime unit of POSBG are supported with Proton NMR. The work is aimed to develop new valuable biosensor and conducting copolymer molecule to serve as useful biochip and a biocompatible template. © 2007 Wiley Periodicals, Inc.

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