



SYNTHESIS AND CHARACTERIZATION OF NEW CELLULOSE DERIVATIVE FILMS BASED ON THE HYDROXYETHYL CELLULOSE PREPARED FROM "STIPA TENACISSIMA" CELLULOSE OF EASTERN MOROCCO. PART I: SOLUBILITY STUDY

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Hydroxyethyl cellulose Acetate (HECA) was prepared starting from hydroxyethyl cellulose (HEC), acetic anhydride and perchloric acid which was used as catalyst. The synthesized product was characterized by FTIR, ¹³C NMR and ¹H NMR. Substitution degree (DS) of HECA was determined using FTIR spectra taking a classical titration method as reference. The ¹H NMR spectroscopy was also used to confirm the results obtained by FTIR. The DS is substantially affected by the temperature, the time of reaction and especially the equivalent number (eq. nb.) of the acetic anhydride added. We have studied and discussed in the context of usage in modification reactions, the solubility of the HECA samples by varying their DS. This investigation was based on the determination of the Flory-Huggins interaction parameters (χ_{12}) using the partial Hansen solubility parameters (HSP). HSP of HEC and the HECA samples were calculated from the Van-Krevelen-Hoftyze (VKH) method and the T. Lindvig approximation. We have focused our work on predicting and controlling family solvents of HECA with various DS, in order to facilitate and to optimize the homogenous modification reaction conditions. From results on a range of HECA samples, it is concluded that their prediction solubility taking the value of DS into account is possible, and then the surface modification can relatively be easily realized. The thermal analysis study shows some differences in T_g and thermal degradation between HEC and HECA, moreover these thermal temperatures are influenced by DS values. Keywords: synthesis; films; acetylating; substitution degree; solubility.