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CHARACTERIZATION OF DYES LOADED POLYVINYL ALCOHOL (PVA) BASED HYDROGELS THROUGH CIELAB METHOD

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Abstract

Hydrogel membranes obtained by neat polyvinyl alcohol (PVA) or PVA with various bio insertions like: Scleroglucan (Scl), Zein (Zein) or Cellulose (Cel), were subjected to diffusion and sorption/desorption experiments using different type of dyes such as: Crystal Violet (CV), Methylene Blue (MB), Congo Red (CR). If the sorption, desorption or diffusion of a dye in/from/through a hydrogel is usually monitored by the dye solution analysis, in this case the transport phenomena are followed by the membrane analysis. Photographic images of colored hydrogels obtained by PVA hydrogel immersion in aqueous solutions of different dyes, with different concentrations have been obtained by using a digital camera CANON Power Shot SX110 with 3456×2592 pixels resolution, in artificial light. The resulted images were processed by using Adobe Photoshop software, CS5 version, and analyzed through CIEL*a*b* system (CIELAB). This method gives the possibility to make difference between two very close colors by taking into account parameters such as: hue, saturation and luminosity.

As a particular case, the present study evidenced, by CIELAB method that all the prepared hydrogels have a good capacity to uptake dyes from aqueous solutions, the highest efficiency being obtained for PVA/Scl hydrogels. Our results are in good agreement with those obtained from SEM and DSC analysis of the loaded gels.

Key words: CIELAB, cryogel, dyes, method, PVA, sorption

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