



**INFLUENCE THE RATE OF VINYL ACETATE ON THE SOLUBILITY OF THE POLYMER  
EVAC.EXPERIMENTATION AND MODELING**

A. Oughilas<sup>1</sup>, A.Benghalem<sup>1</sup>

<sup>1</sup>Faculté des Sciences, Laboratoire LMC, Université Djillali Liabes de Sidi Bel Abbès, B.P.89, Sidi Bel Abbès, 22000, ALGERIA

[oughilasahmed@yahoo.fr](mailto:oughilasahmed@yahoo.fr)

The works of this research present, on one hand, a study on the evaluation of transfers and measure of the diffusivity of a mixture (toluene / hexane) through an EVAc polymer matrix type and on the other hand, a detailed study on the diffusivities of a series of primary alcohols, polar solvents and not polar solvents. In both cases, the role of the copolymer vinyl acetate is emphasised.

The EVAc material is often quoted as permeable or semi permeable macro-molecular walls, they possess an ability to react, and the very high capacities of exchange which because of their chemical and thermal stability constitute, in addition to their strong capacity of exchange, a range of materials frequently used.

Kinetics of transfer were followed to determine the nature of the transfer and also to know if the process is harmful for the material.

The obtained results show that if the transfer of solvent and/or mixtures takes place through EVAc bead of weak composition, then the process is simple and can be described as a passing distribution; but if the transfer has taken place through the EVAc bead of high composition, then the process is complex; and cannot be described as a passing distribution (broadcasting).

The consequent inflation observed with the mixed solvent that causes a gelification and a total dissolution of the bead 28.40, can be interpreted by:

1. the strength of the solvent which will be considered as the best solvent for the macromolecular chains that the pure solvents (approximately some simple liquid) in agreement with Scott's hypotheses and Flory;

2. by the existence of strong interactions between the participants of the system (EVAc - Solvents), capable of breaking the bond which assure the cohesion of the polymer material.

The second type of transfer concerns the diffusivities of alcohols R-OH through EVAc bead. In that case, the process is simple even with vinyl acetate; it generates no inflation. Alcohols penetrate into the material by respecting their magnitude of sorption and the radical R plays a determining role.

Other types of transfers were also studied:

Not polar solvent: pentane, hexane, heptanes. Polar aromatic solvent: benzene, toluene, pyridine, and aniline; of halogenes solvents: dichloromethane, trichloromethane and tetrachloromethane and solvents of carboxylic acid type.

Our purpose was to study the effect of the vinyl acetate on the power of absorption of EVAc beads. A correlation between the power of absorption of EVAc bead and the parameter of solubility  $\delta$  solvents was established. The results are discussed in terms of parameters of solubility, parameters of interactions X and the hydrogen bonding, according to Hildebrand's theory.