



University Kasdi Merbah Ouargla
Faculty of Mathematics & Matter Sciences
Department of Chemistry



Year: 2023\2024 **Course:** Macromolecular chemistry **Level:** M2 applied chemistry

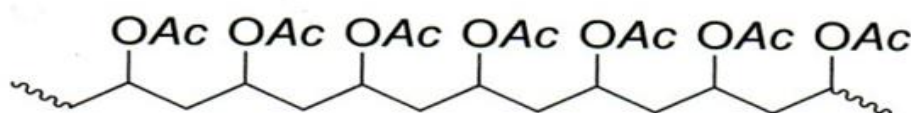
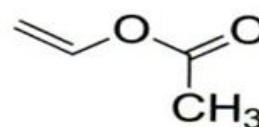
TD N3: Polymerisation ionique

Exercise 1:

Vinyl acetate is capable of giving a polyaddition chain reaction in the presence of a Bronsted acid. The monomer used and the polymer obtained have the following structures.

(Ac corresponds to the group $\text{CH}_3\text{-CO-}$) :

vinyl acetate

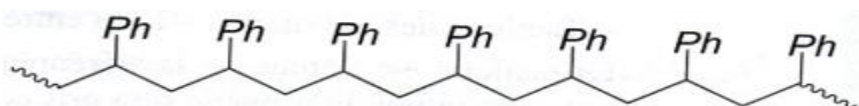


polyvinyl acetate

- 1- Show that the oxonium ion can react with vinyl acetate to give two possible cationic species. Give the structures.
- 2- Show by writing limiting formulas that these two cations have different stability.
- 3- How the previous species can initiate a cationic polymerization reaction with vinyl acetate?
- 4- Write the mechanism of the reaction of the propagation of cationic polyaddition.

Exercise 2:

Polystyrene PS can be obtained by anionic polyaddition of styrene $\text{CH}_2=\text{CHC}_6\text{H}_5$



- 1- What is the difference between anionic polyaddition and radical polyaddition.?
- 2- What type of initiator should be used in the case of anionic polyaddition?.give some examples.
- 3- Write the mechanism of the anionic polymerization chain reaction of styrene by butyllithium $\text{C}_4\text{H}_9\text{Li}$.
- 4- This anionic polyaddition has the advantage of giving very regular polymers. for which reason?
- 5- What precautions must be taken in order to limit the termination reactions of this chain polymerization?