

Exercice 10

- Calcul de la concentration des Radicaux

$$[M^*] = \sqrt{\frac{2f k_d}{k_t}} [A]$$

AN: $[M^*] = \sqrt{\frac{2 \times 0,5 \times 0,88 \times 10^5 \times 10^{-3}}{7,2}}$

$$[M^*] = 3,44 \times 10^{-5} \text{ mole/l}$$

2

- Calcul de la vitesse de Polymérisation

$$v_p = k_p [M] [M^*]$$

AN: $v_p = 176 \times 3,44 \times 10^{-5} \times 0,1$

$$v_p = 0,6 \times 10^{-3} \text{ L} \cdot \text{mole} \cdot \text{s}^{-1}$$

2

- Calcul du degré de Polymérisation Moyen en nombre

$$\bar{X}_n = \lambda \quad (\text{En general})$$

$$\bar{X}_n = \frac{v_p}{\frac{v_t}{t}} = \frac{v_p}{k_t [M^*]^2} = \frac{0,6 \times 10^{-3}}{7,2 \times (3,44 \times 10^{-5})^2}$$

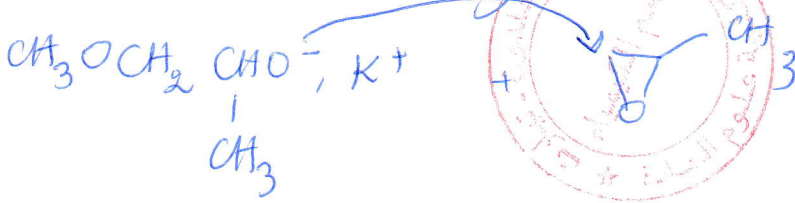
$$\bar{X}_n = 70420$$

$$\bar{X}_n = \lambda = 70420$$

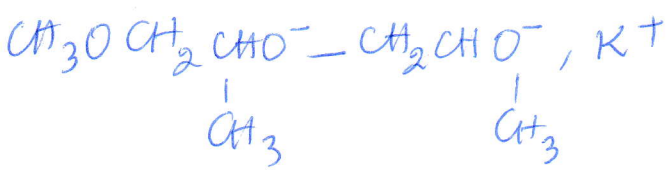
2

Exercice 2°

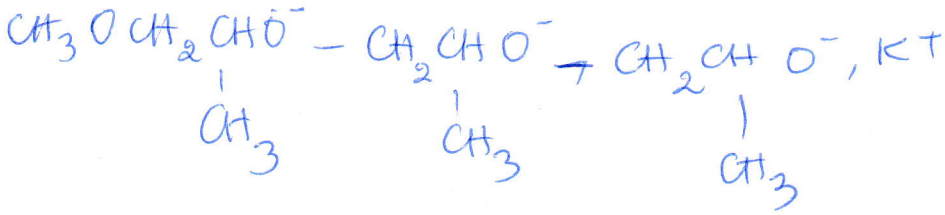
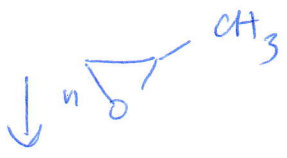
1 - Mécanisme de polymérisation



↓



(9)



2. Le degré de Polymérisation si la conversion est totale

$\bar{X}_n = \frac{n_{\text{monomère}}}{n_{\text{Amorceur}}} \times 1$ si la conversion est 100%

$n_{\text{Amorceur}} = \frac{m}{M} = \frac{0,1}{128} = 0,781 \times 10^{-3} \text{ mole}$

$n_{\text{monomère}} = 86 \times 10^{-3} \text{ mole}$

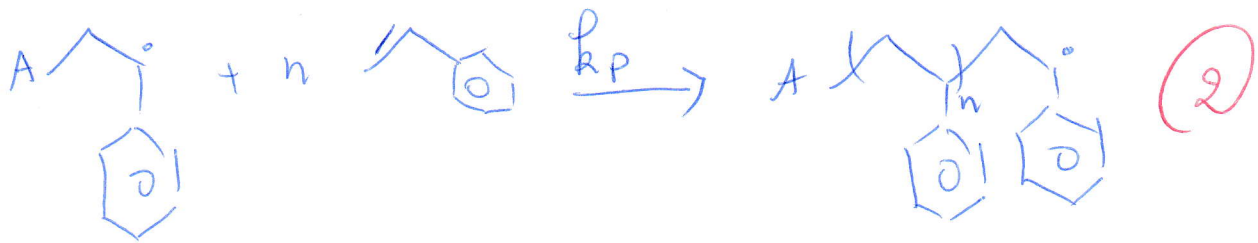
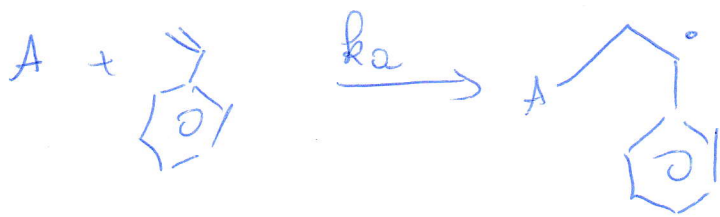
(2,5)

$\bar{X}_n = \frac{86 \times 10^{-3}}{0,781 \times 10^{-3}} = 110 \text{ mde}$

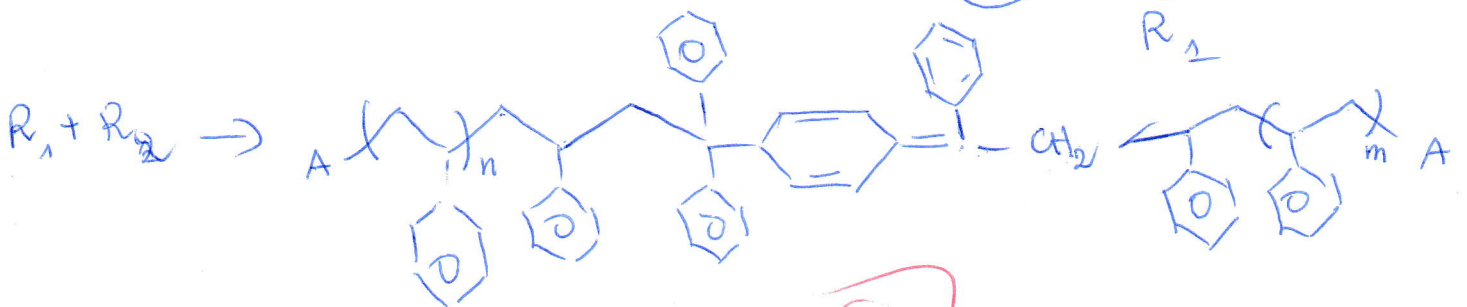
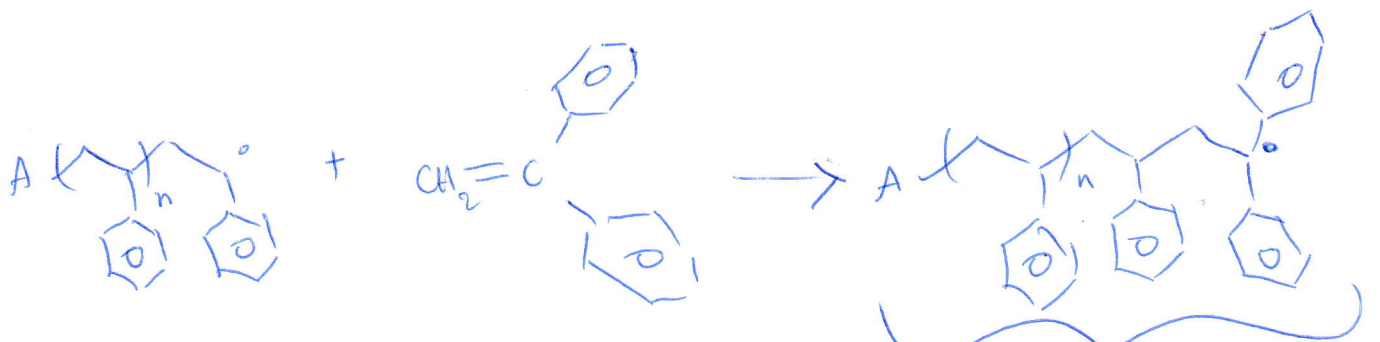
Exercice 3:

Contrôle des réaction de Polymérisation du Styrene

les étapes d'Amorçage et de propagation sont toujours les mêmes. le Contrôle se diffère avec les différents agents de Contrôle.

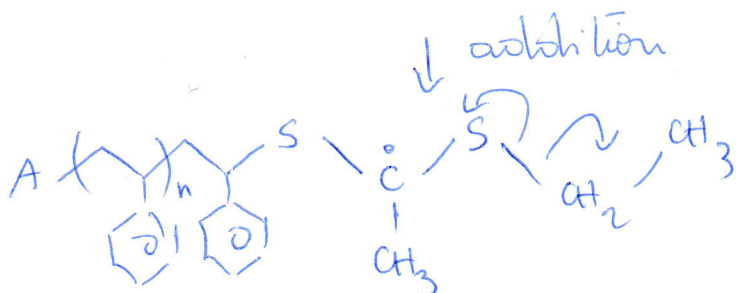
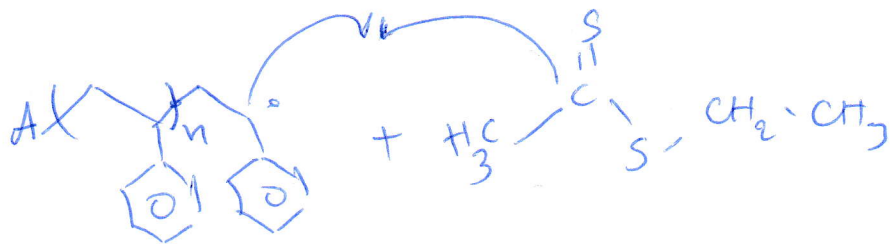
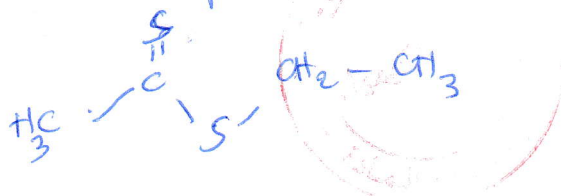


(1) - Contrôle en présence de DPE

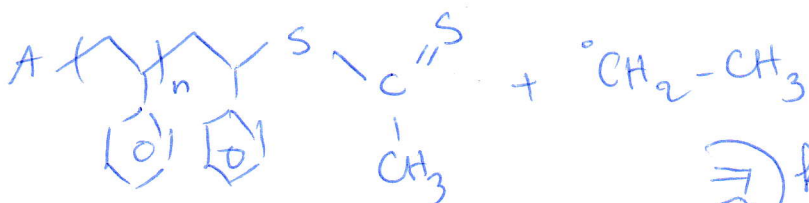


$$I_p = 1,7 \cdot \frac{0,15}{3}$$

2. Contrôle en présence de Thio carbonyl Thio



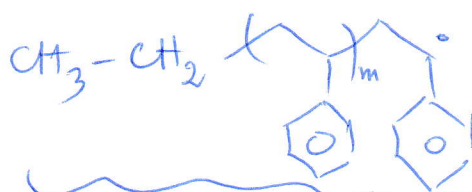
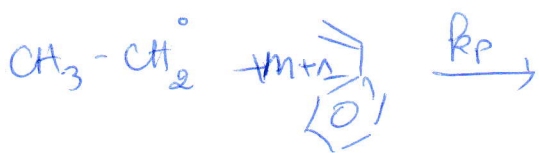
↓ Fragmentation



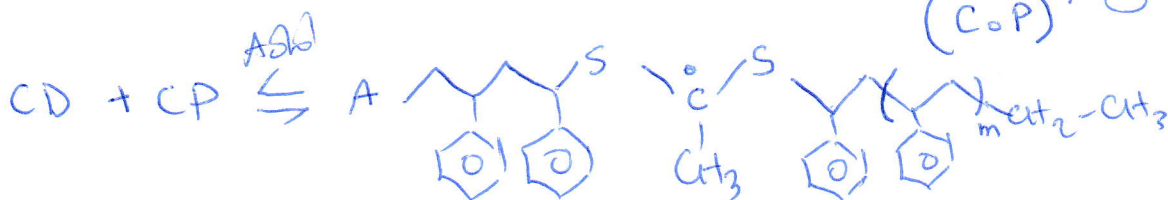
chaîne Dormante (C.D)

↳ k_p ramorçage

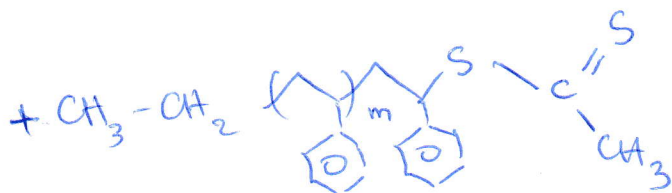
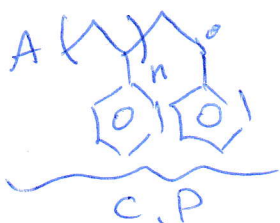
(2)



chaîne propagée (C.P)



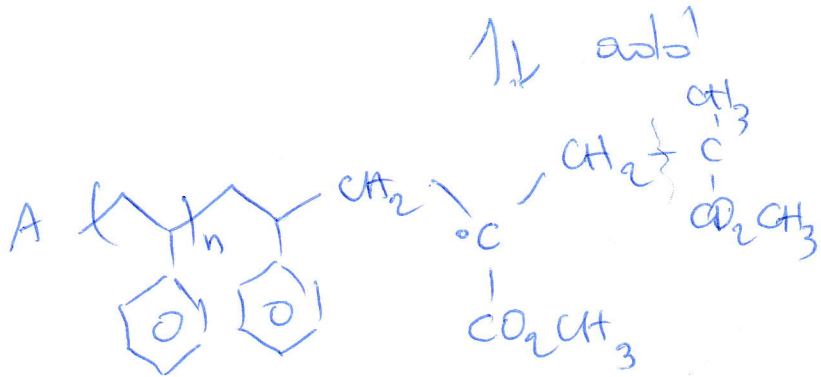
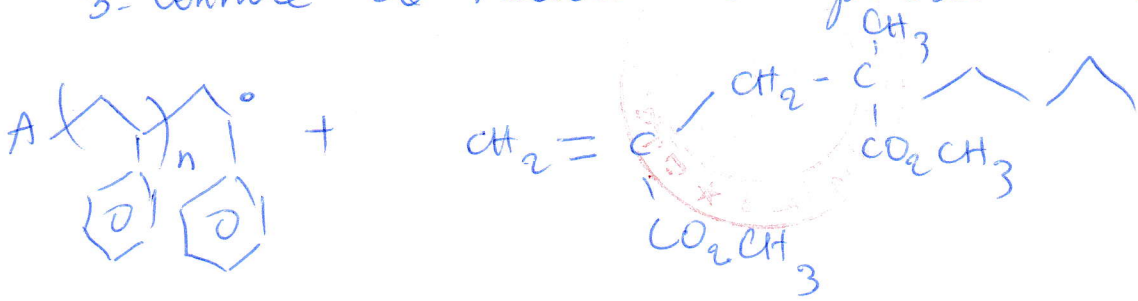
↑↓



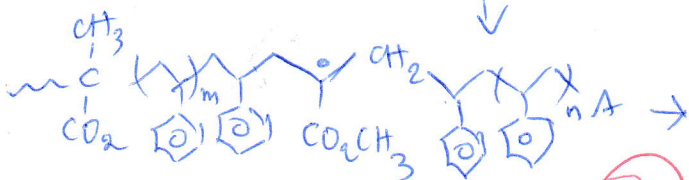
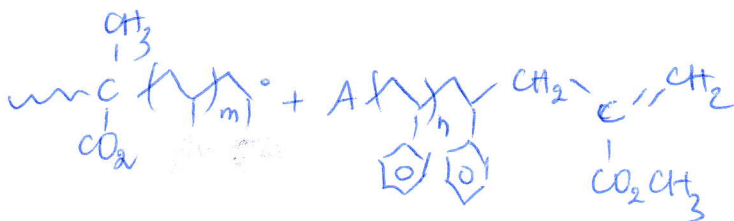
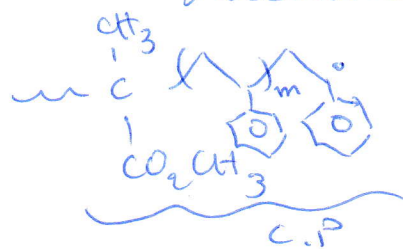
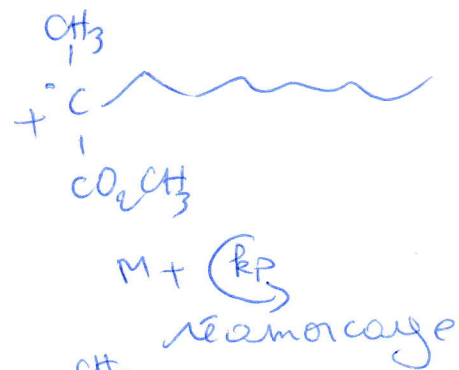
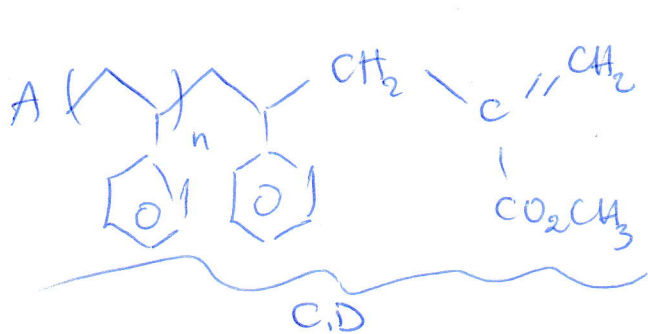
C.D

(13) $I_p = \frac{M}{4}$

3- Contrôle de la réaction en présence de PMMA



$\downarrow \text{fragmentation}$



$IP = 1,13$

