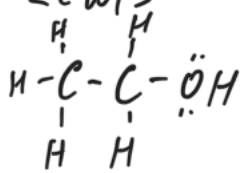
Polymer Review Unit 5

- Lewis → condensed → line bond



H_3C-CH_2-OH → 

- Functional Groups

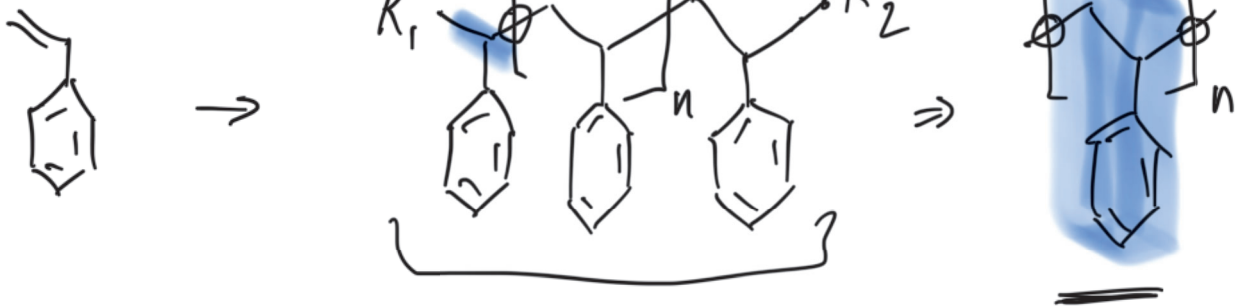
$R-OH$ $R-\overset{O}{\overset{\|}{C}}-OH$ $R-NH_2$

$R-\overset{O}{\overset{\|}{C}}-Cl$

$R_1-\overset{O}{\overset{\|}{C}}-\underset{H}{N}-R_2$ amide

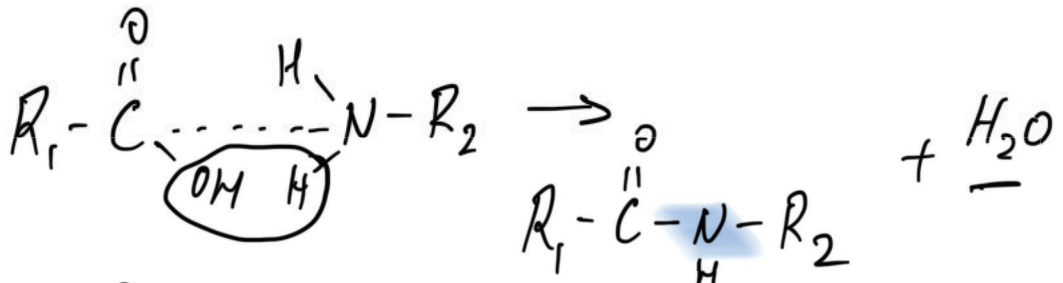
$R_1-\overset{O}{\overset{\|}{C}}-O-R_2$ ester

- Polymer shorthand

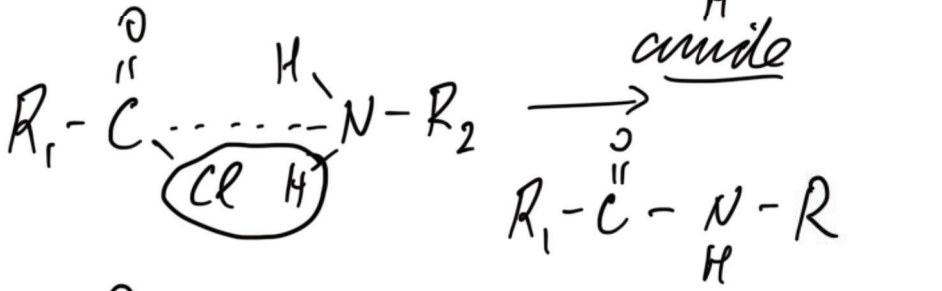


Condensation

acid + amine



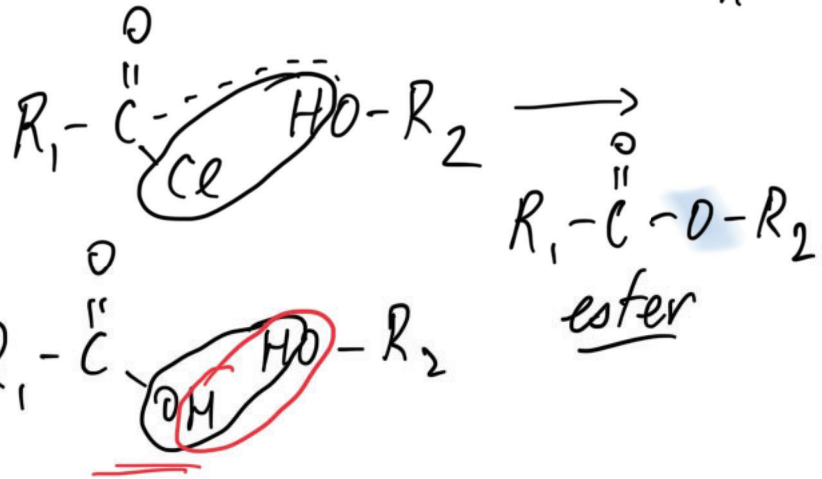
acid chloride + amine



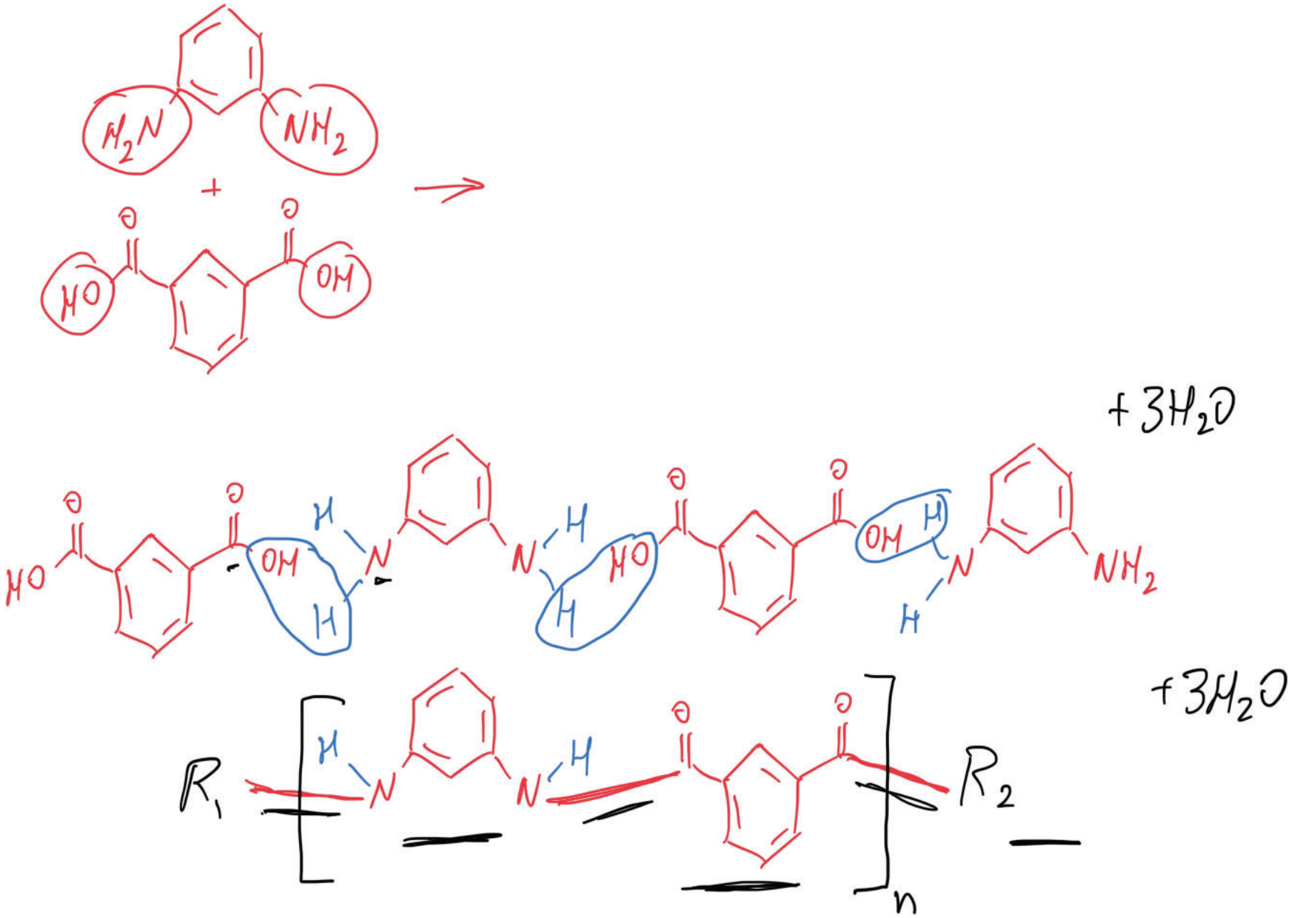
amide

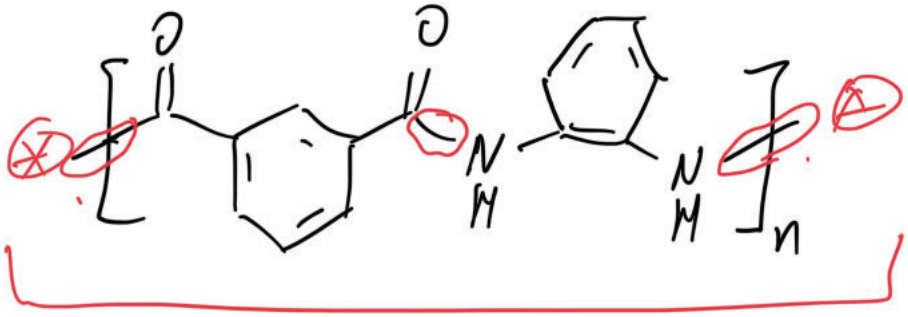
acid + alcohol

acid chloride + alcohol



ester


H_2N
NH_2
+
HO
OH
$+3H_2O$
$+3H_2O$
R_1
R_2
n



$+ n\ H_2O$

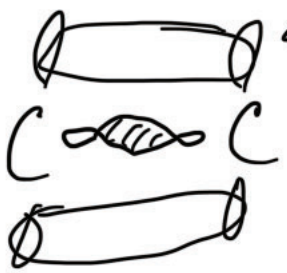
Addition

$-C=C-$

1 σ bond

1 π bond

reactive

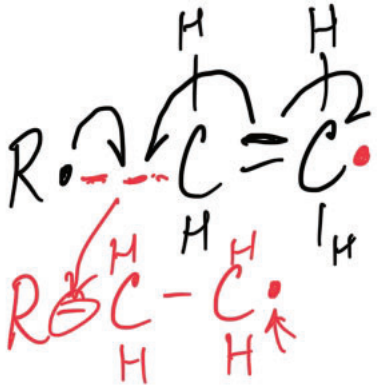


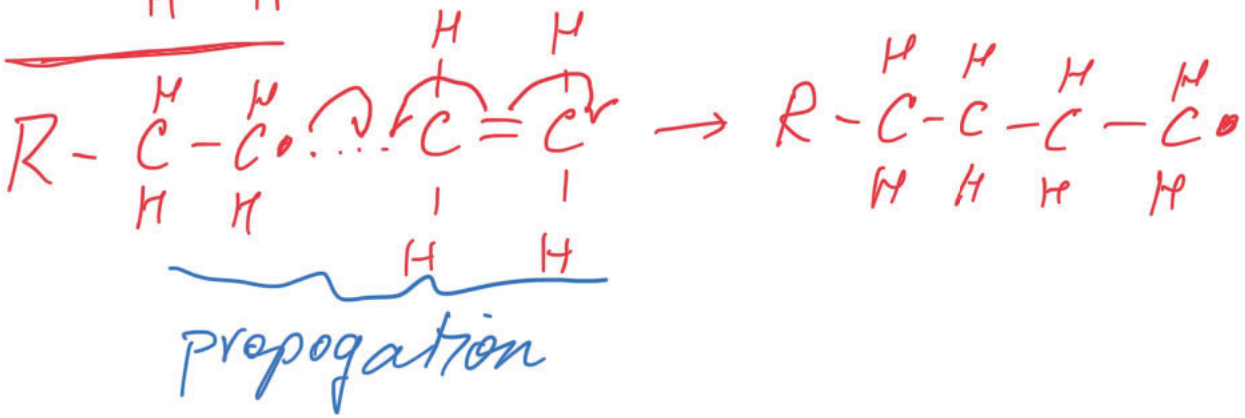
unpaired e^-

$R\cdot$

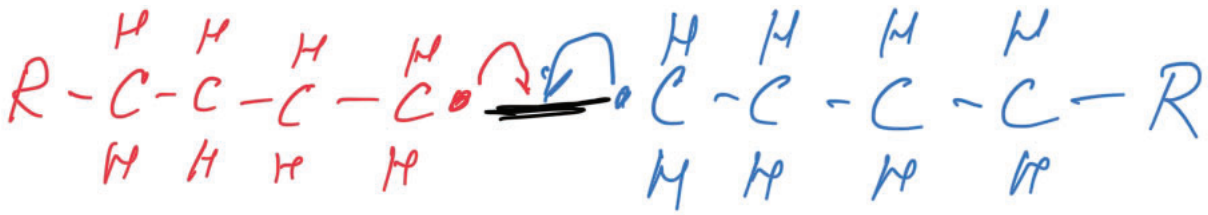
$RO\cdot$

initiation

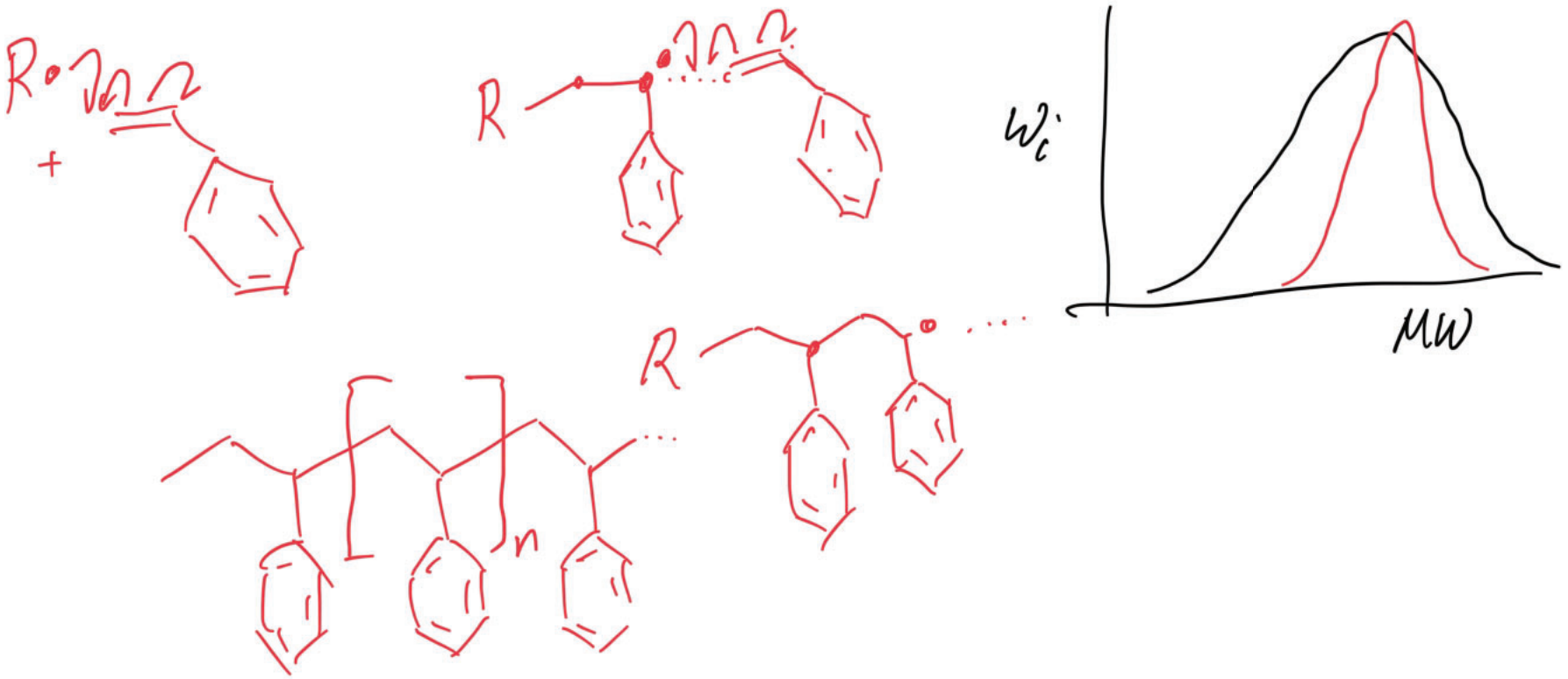




propogation



terminazione



addition →

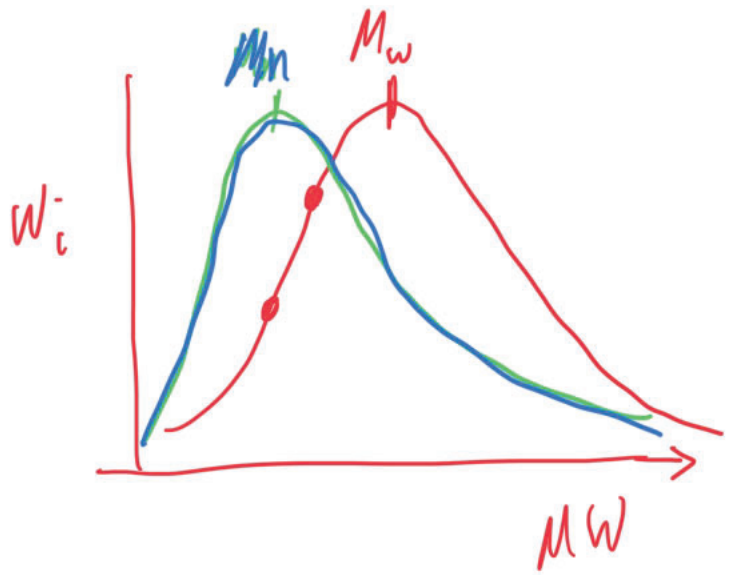
not $-NH_2$

single monomer

A) condensation

→ B) addition

→ C) both



$M_w \rightarrow w_i$ weight fraction

M_n n_i number fraction

$$M_w = \sum_i w_i \, MW_i$$

$$M_n = \sum_i x_i \, MW_i$$

$0 \rightarrow 1$

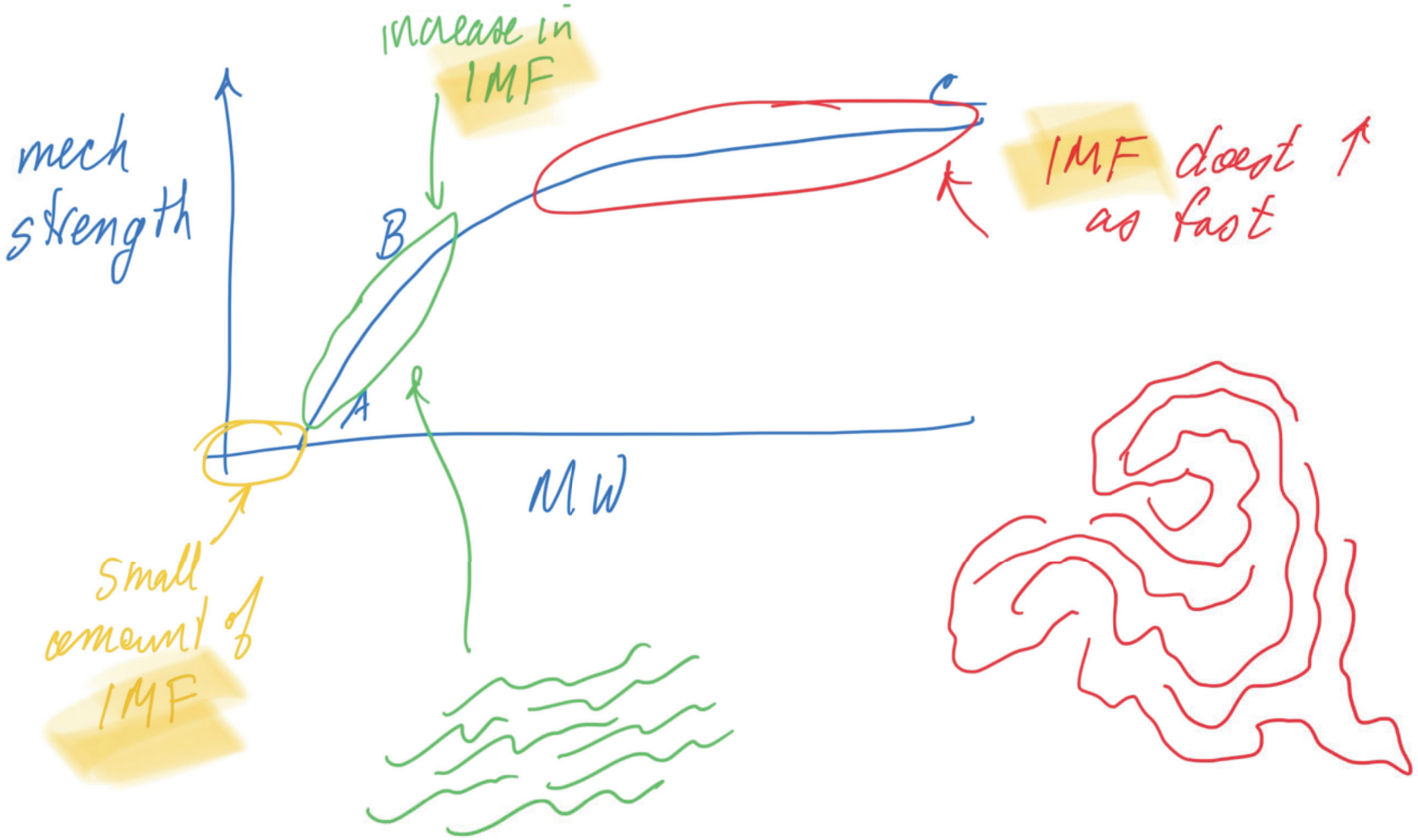
w_i - fraction of total polymer weight of MW_i

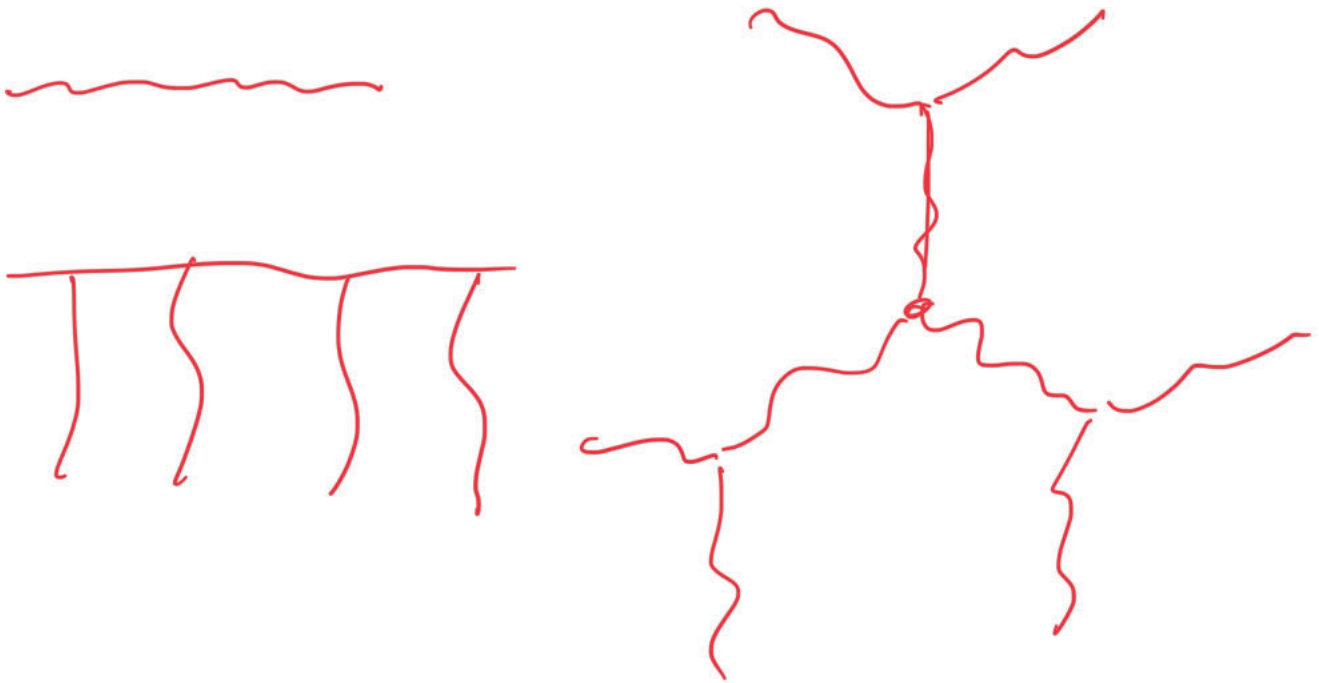
x_i - mole fraction of MW_i

$$x_i = \frac{n_i}{n_{total}}$$

$0 \rightarrow 1$

χ


increase in IMF
mech strength
B
C
IMF doesn't ↑ as fast
A
MW
small amount of IMF



architecture ⟷ IMF → mechanical properties