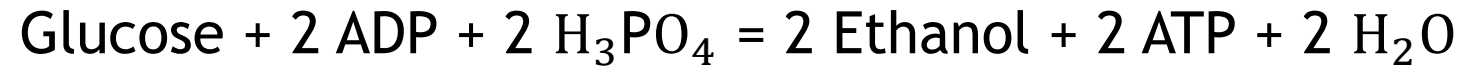


# Catalyse

El: les complexes des métaux de transition

Gaëtan GASTON

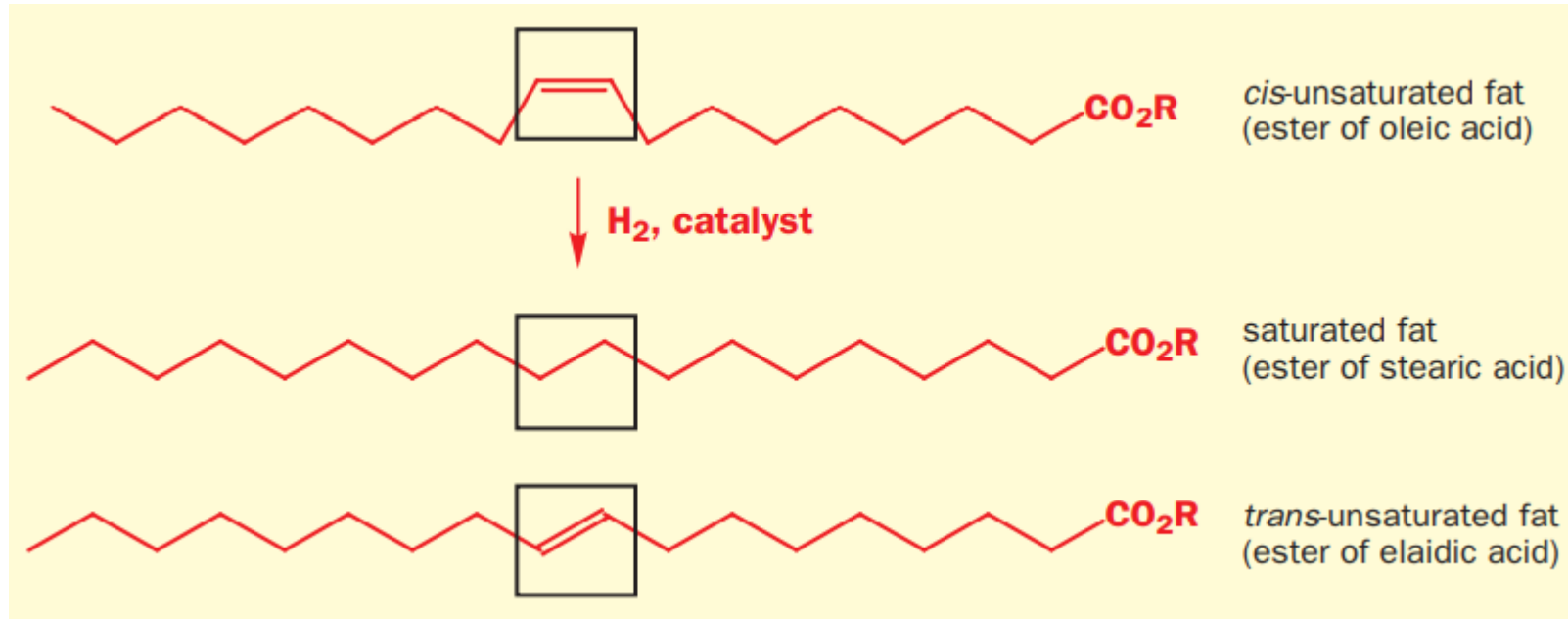
# Fermentation Alcoolique:



## Chronologie:

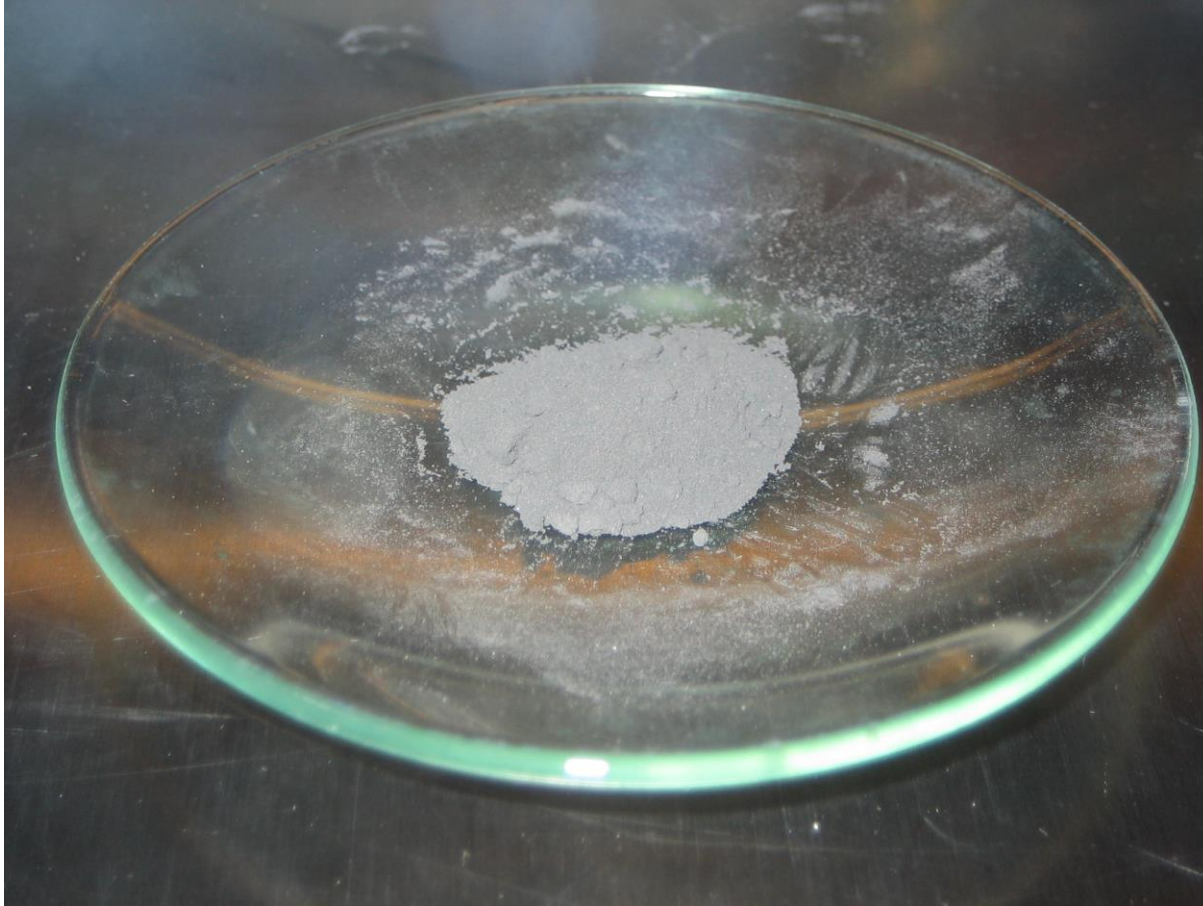
- 6000 ans avant J.C. : Utilisé par les sumériens en mésopotamie
- 1815: Joseph Louis Gay-Lussac: équation bilan
- 1897: Premier pas vers une élucidation mécanistique: Eduard buchner

## Procédé de fabrication de la margarine



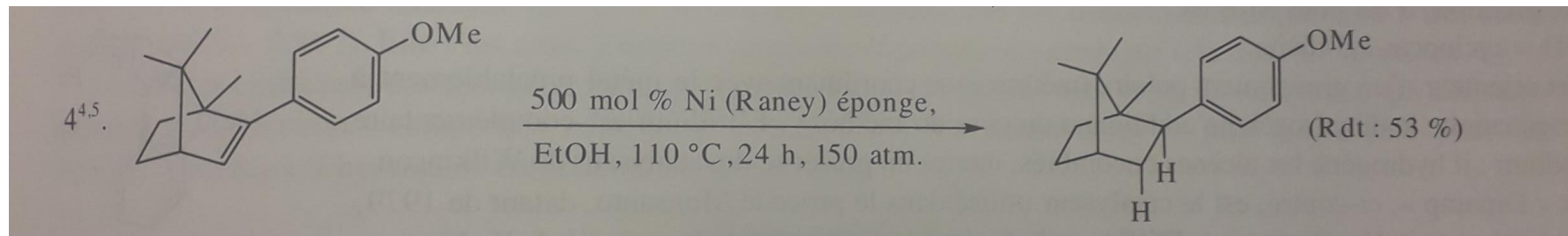
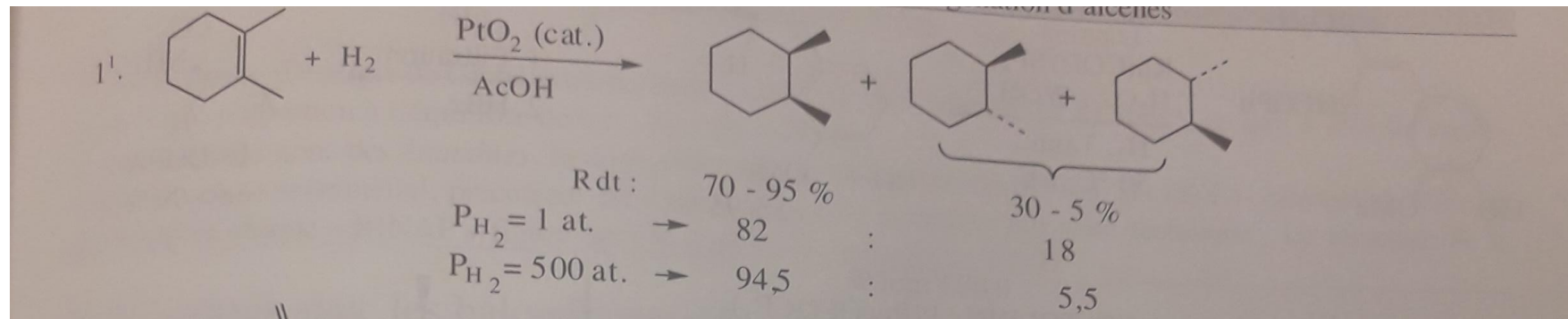
Clayden, Organic chemistry

# Nickel de Raney



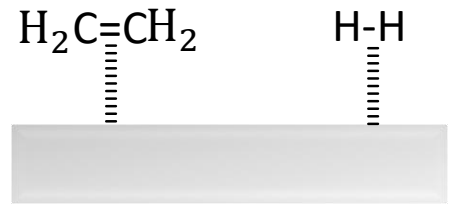
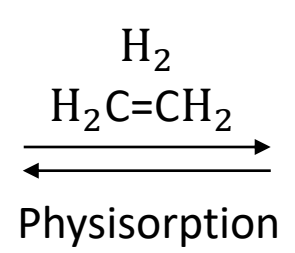
Wikipédia

## Catalyse hétérogène : exemples

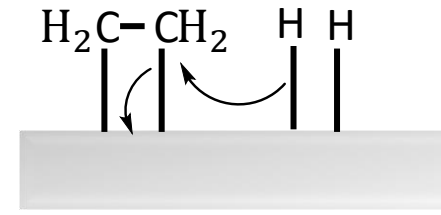
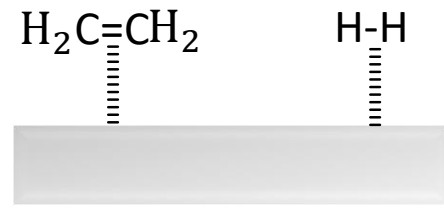
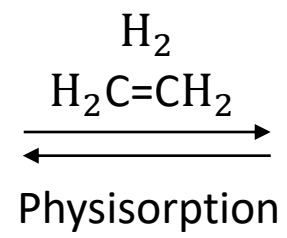


Catalyseur

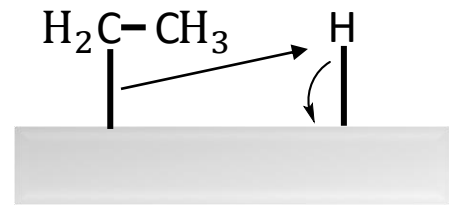
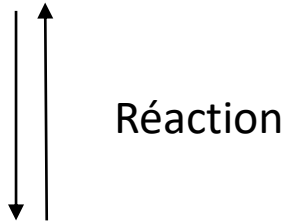
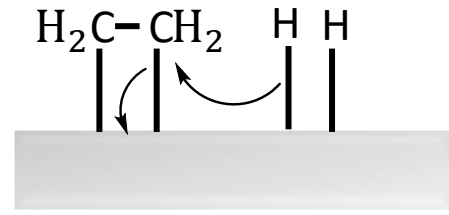
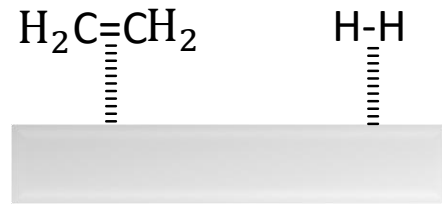
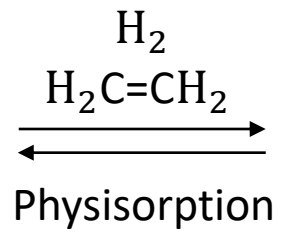
Catalyseur



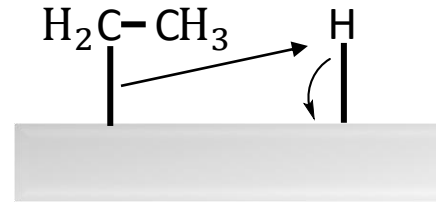
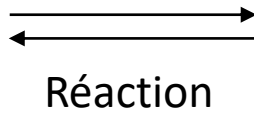
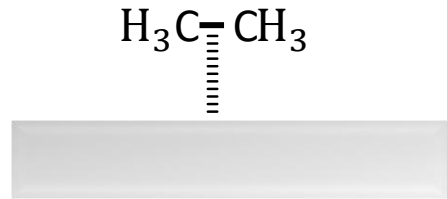
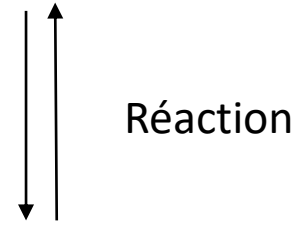
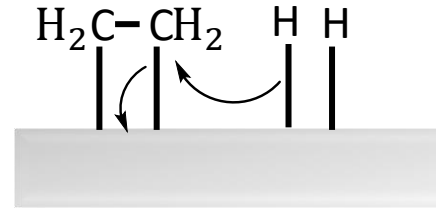
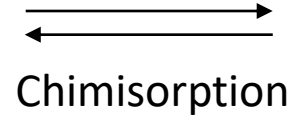
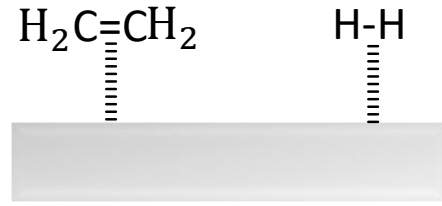
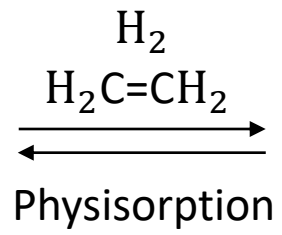
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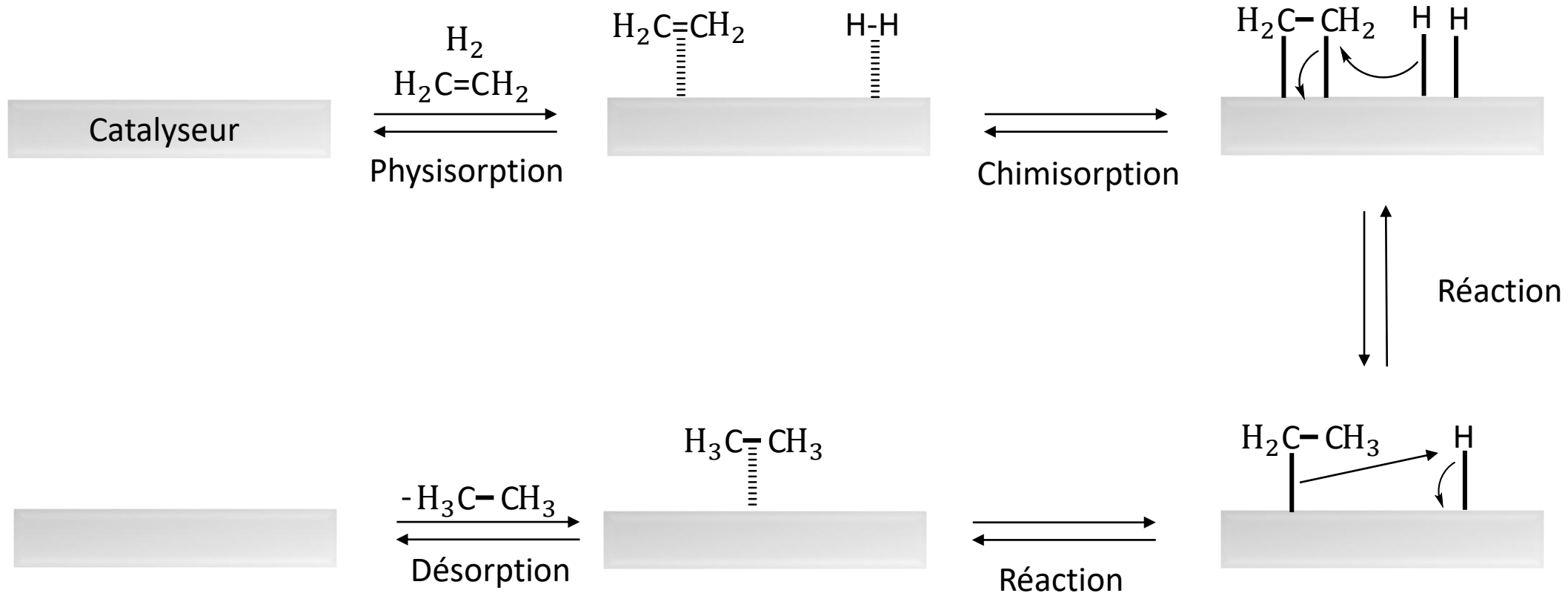


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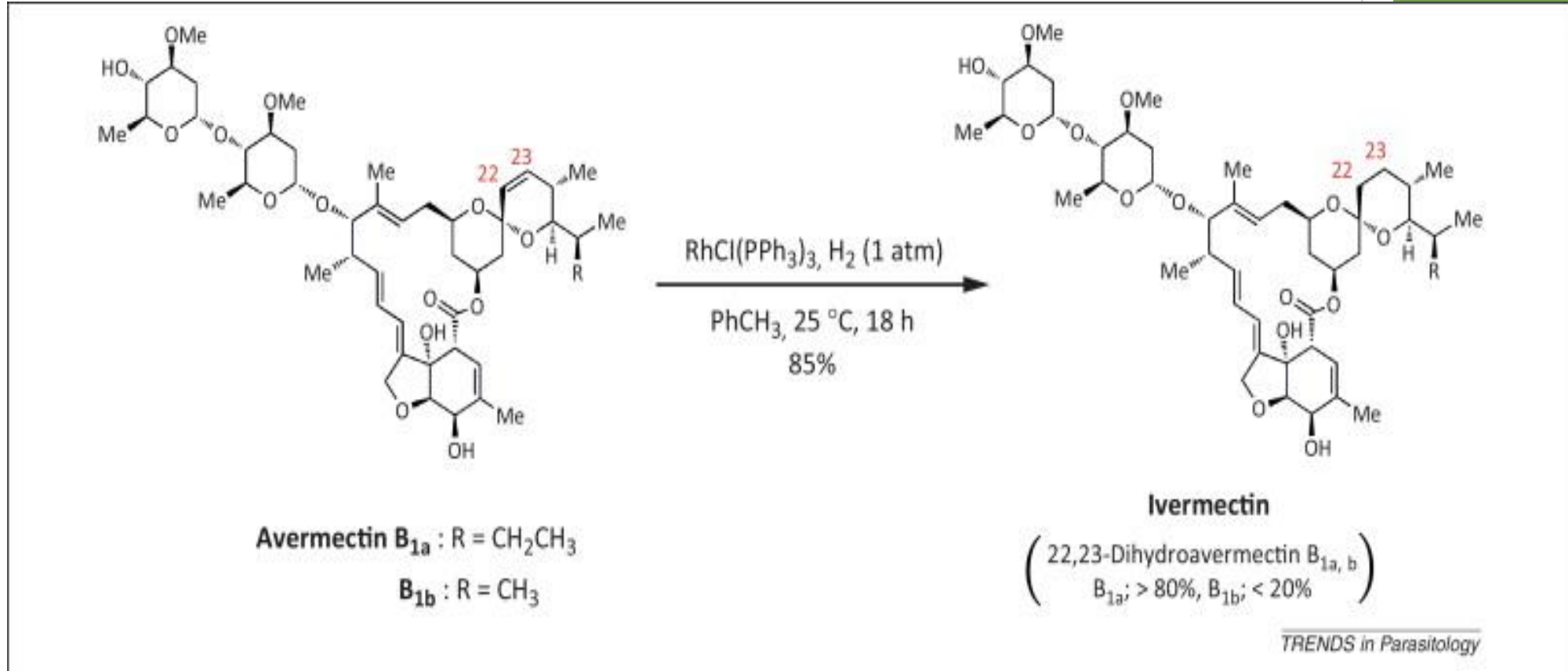


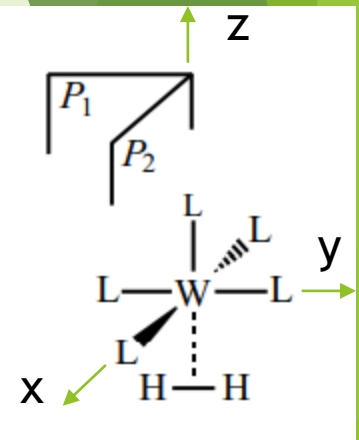
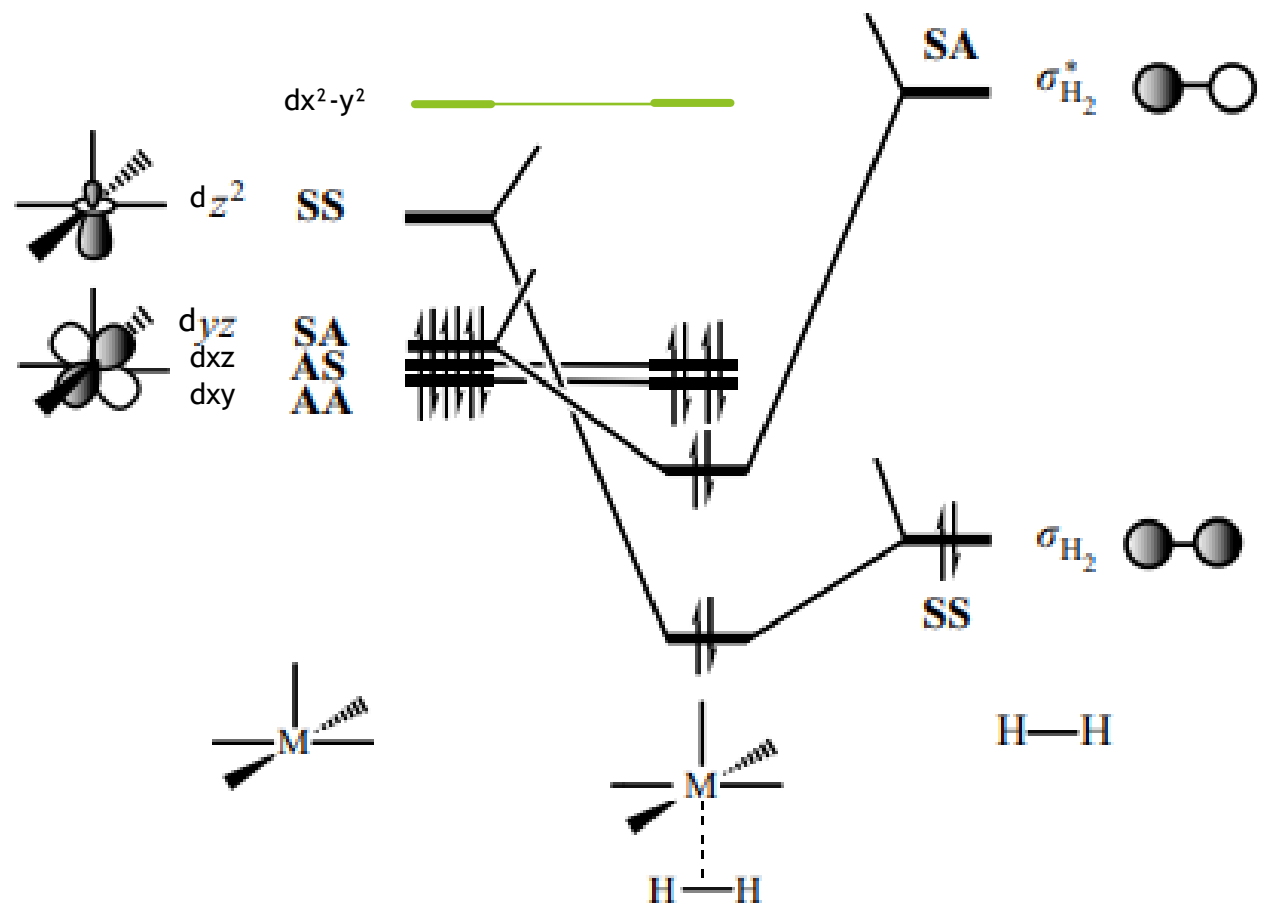
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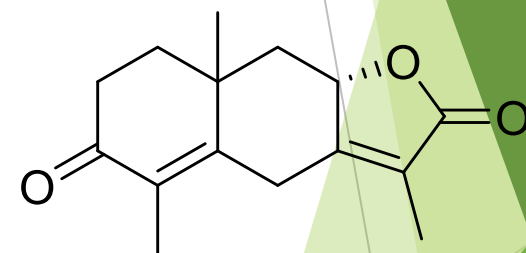
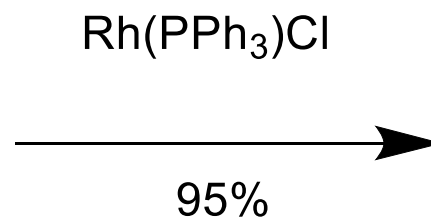
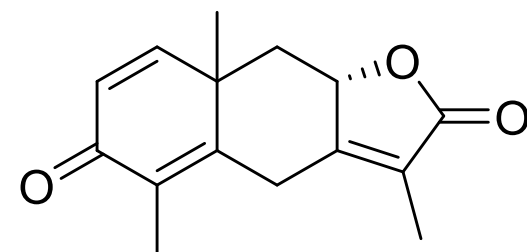
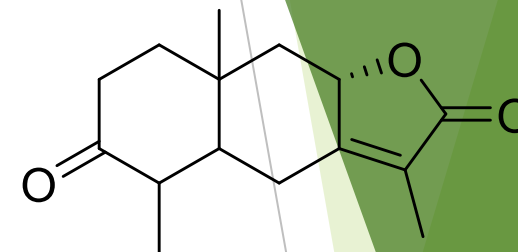
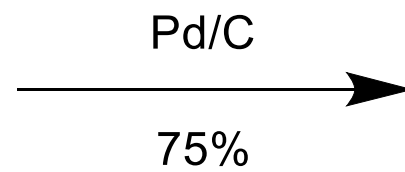
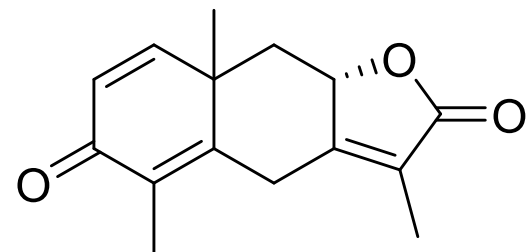




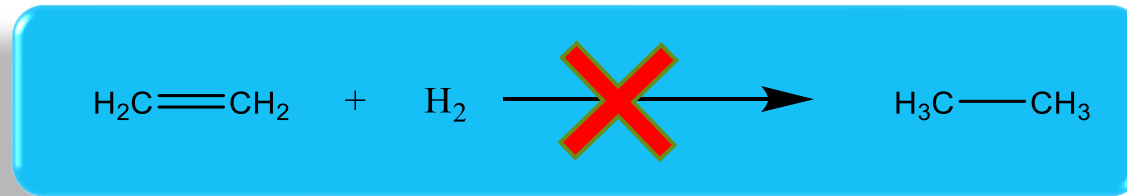
## Synthèse de l'ivermectin (médicament contre la cécité des rivières)







# Conclusion



Catalyseur

Métal solide | hétérogène

Complexes | homogène

Mécanisme

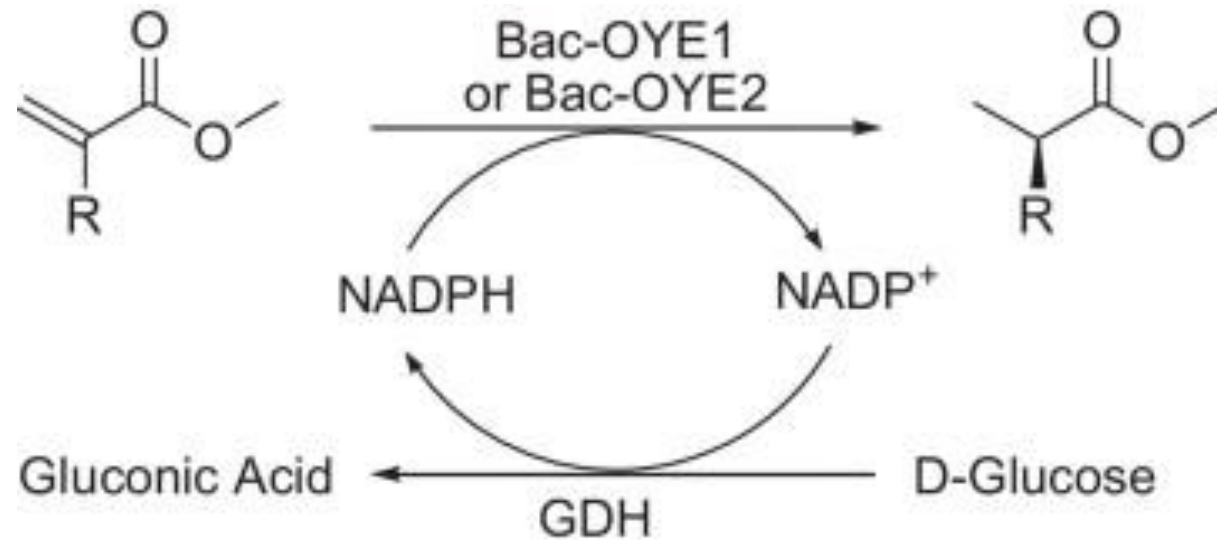
Cycle catalytique

Etape clé: adsorption

Activation



# Catalyse enzymatique



$R > 99\%$   
 $ee > 99\%$

$T = 37,5^\circ C$   
 $P = 1 \text{ bar}$

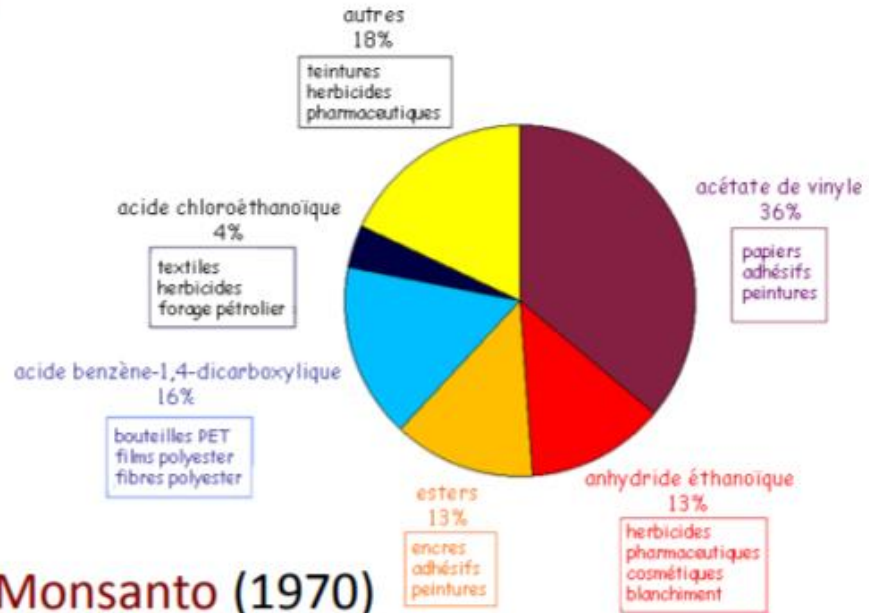
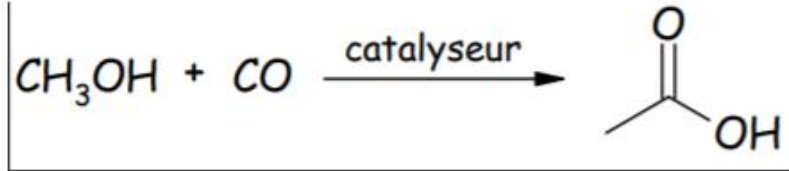


Jean perrin: p730 installation industrielle hydrogénation

Et procédé monsanto

**Production annuelle :**

6 millions de tonnes



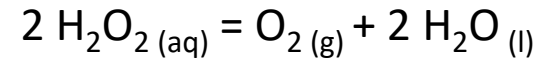
|                         | Procédé BASF  | Procédé Monsanto (1970) |
|-------------------------|---------------|-------------------------|
| Catalyseur              | Cobalt        | Rhodium                 |
| Concentration           | $10^{-1}$ M   | $10^{-3}$ M             |
| Température             | 230°C         | 180°C                   |
| Pression                | 500-700 atm   | 30-40 atm               |
| Sélectivité             | 90%           | > 99%                   |
| Effet de H <sub>2</sub> | sous produits | aucun                   |

*jusqu'à 40wt% ! (EtOH, MeCHO, méthane)*

Cours.espci.fr

# Introduction

Equation bilan:



Thermodynamique -> sens direct

Cinétique -> pas d'évolution à l'échelle de la minute

Actes élémentaire en présence de iodure de potassium.

