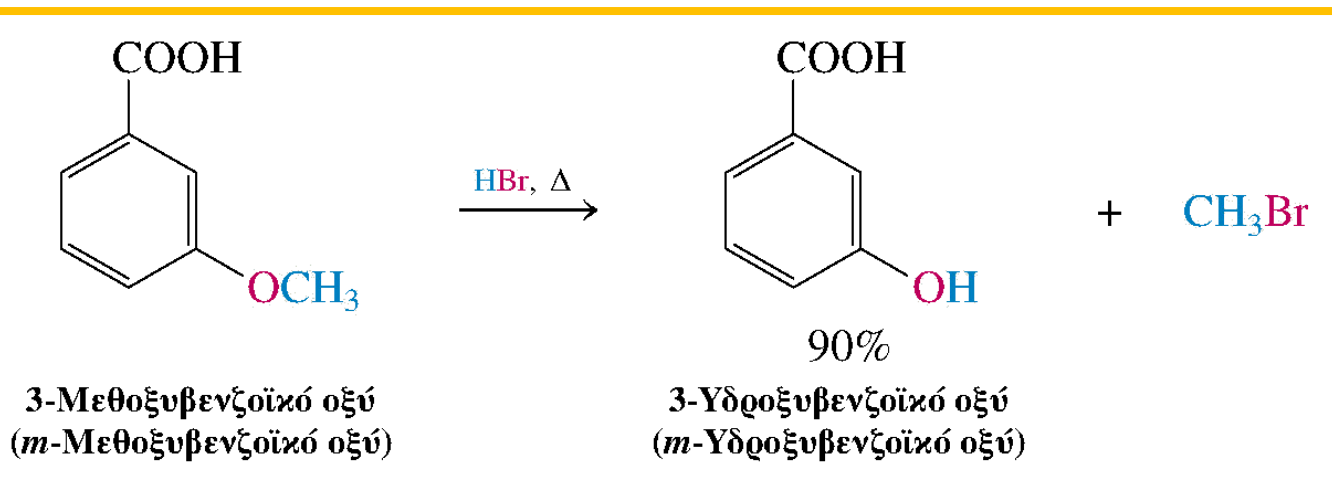
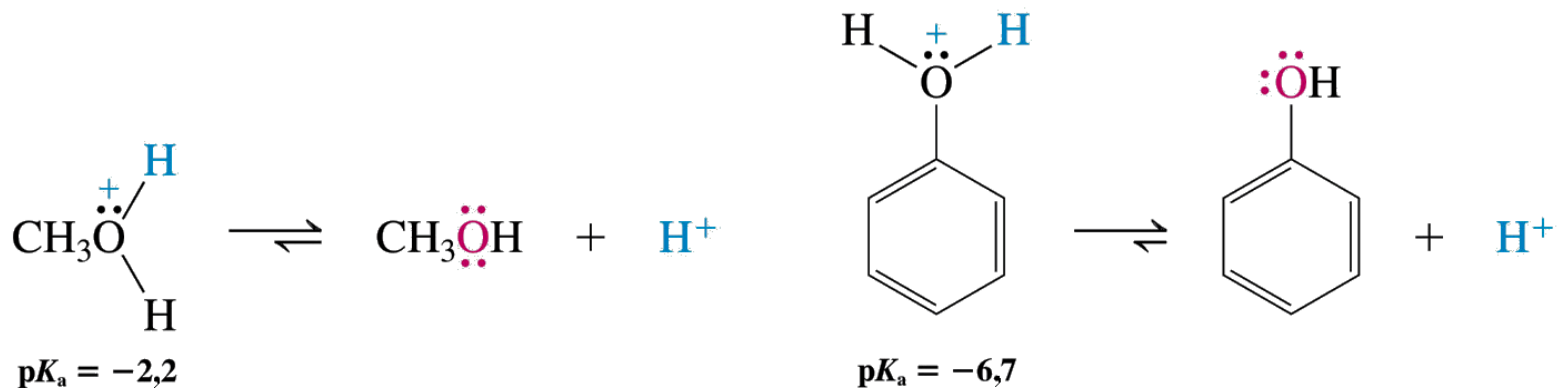


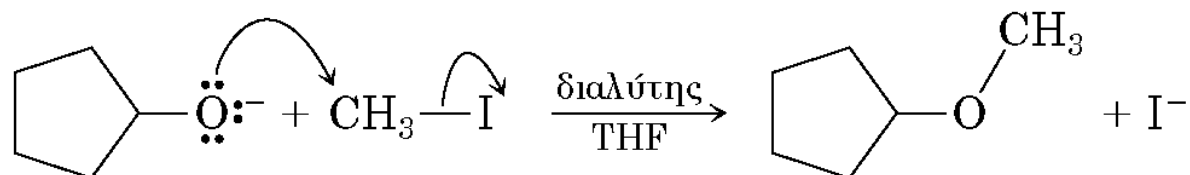
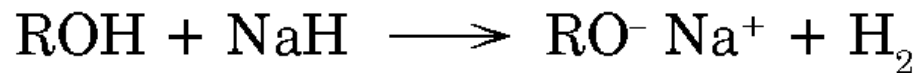
Χημεία των φαινολών

Οι φαινόλες ως βάσεις

Τιμές pK_a του ιόντος του μεθυλο- και του φαινυλο-οξωνίου

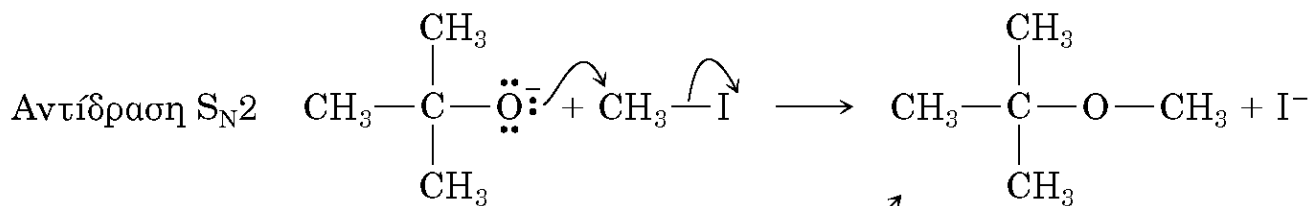


Σύνθεση Αιθέρων κατά Williamson



Ιόν κυκλοπεντοξειδίου

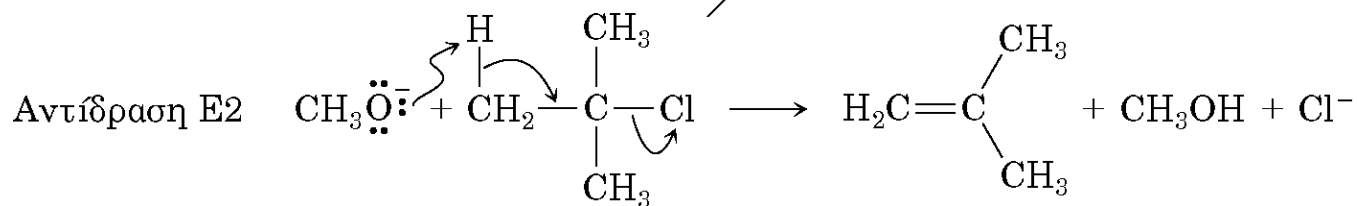
Κυκλοπεντυλο μεθυλο αιθέρας
(74%)



Ιόν
tert-Βουτοξειδίου

Ιωδομεθάνιο

tert-Βουτυλο μεθυλο
αιθέρας

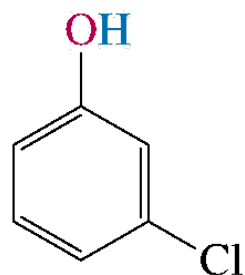


Ιόν
Μεθοξειδίου

2-Μεθυλο-2-
χλωροπροπάνιο

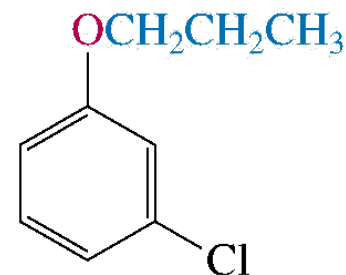
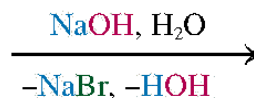
2-Μεθυλοπροπένιο

Οι φαινόλες στη σύνθεση Williamson



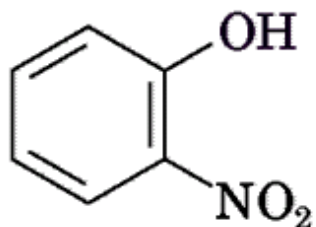
3-Χλωροφαινόλη
(*m*-Χλωροφαινόλη)

+

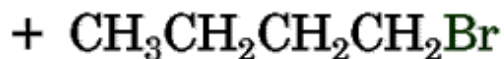


63%

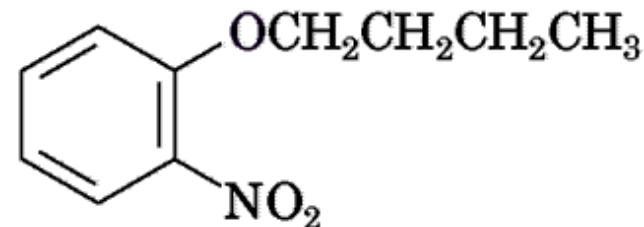
1-Προποξυ-3-χλωροβενζόλιο
(*m*-Χλωροφαινυλο-προπυλαιθέρας)



o-Νιτροφαινόλη

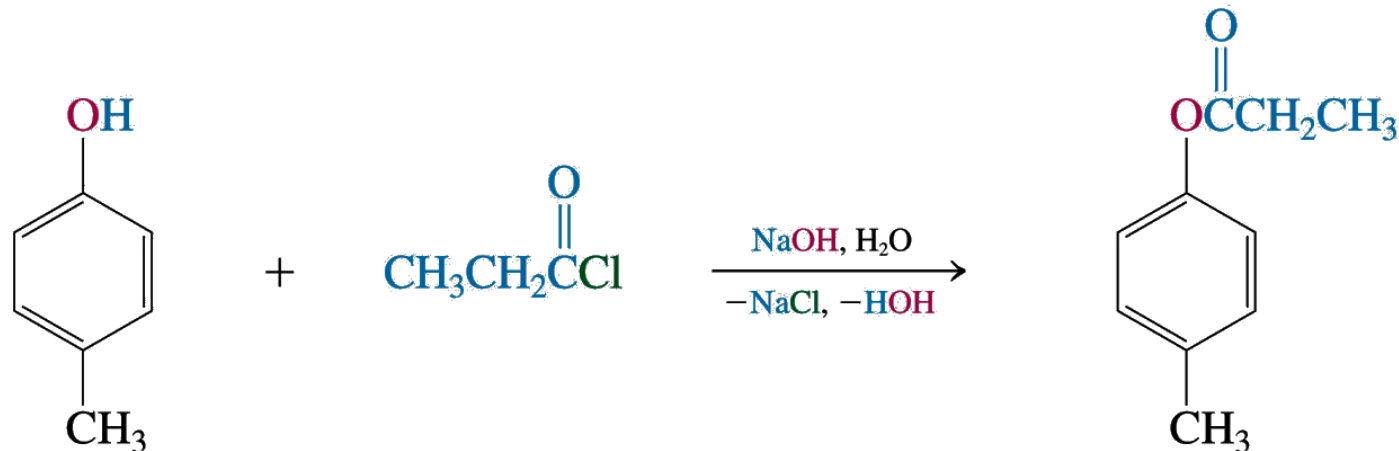


1-Βρωμοβουτάνιο



Βουτυλο *o*-νιτροφαινυλο αιθέρας
(80%)

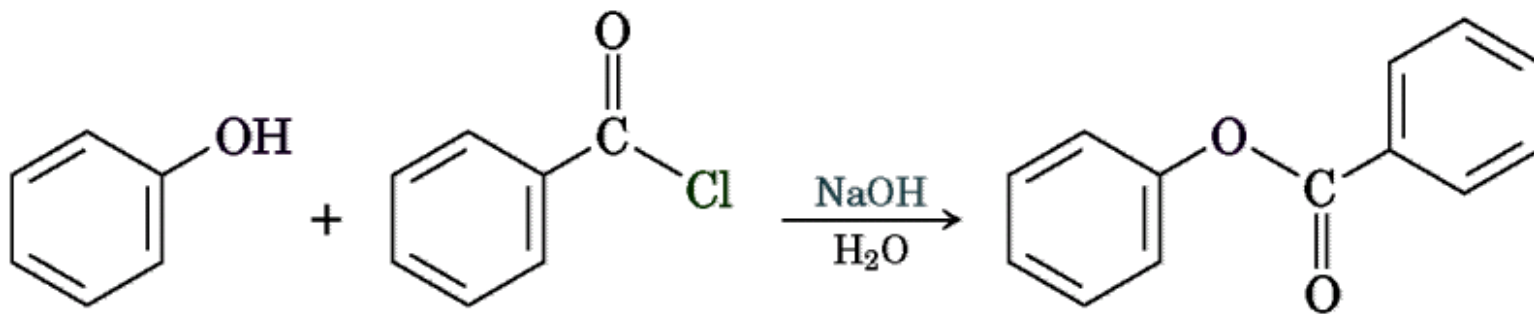
Φαινολεστέρες



4-Μεθυλοφαινόλη
(*p*-Κρεσόλη)

Προπανοϋλοχλωρίδιο

Προπανοϊκός (4-μεθυλοφαινυλ)εστέρας
Προπανοϊκός (*p*-μεθυλοφαινυλ)εστέρας

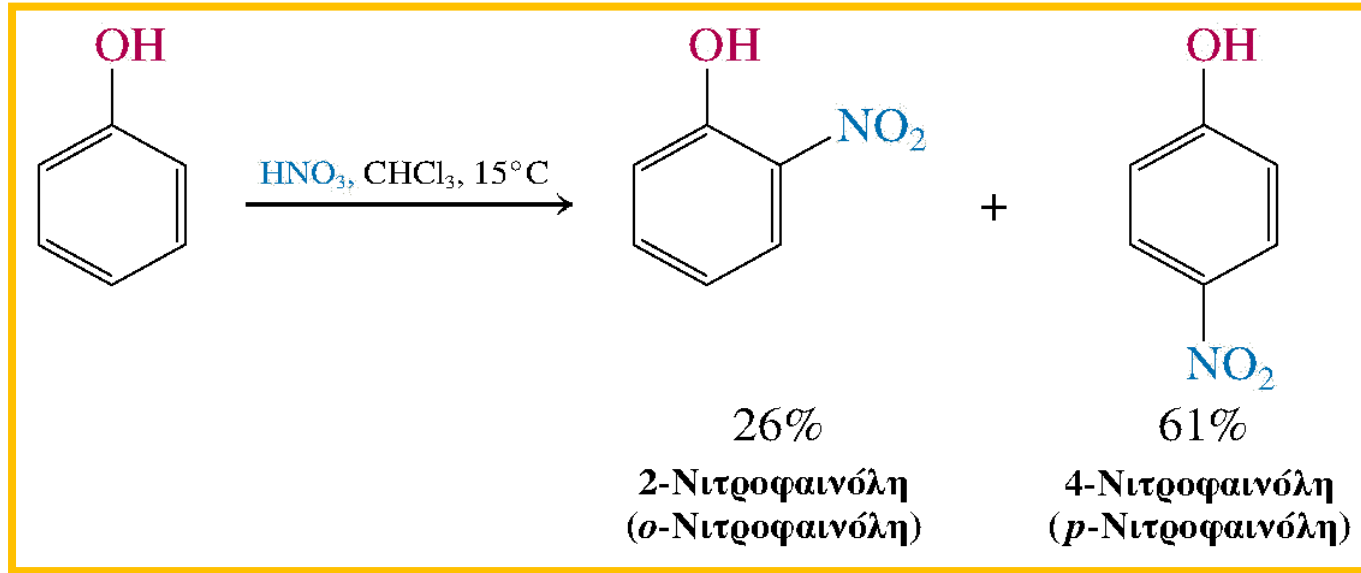


Φαινόλη

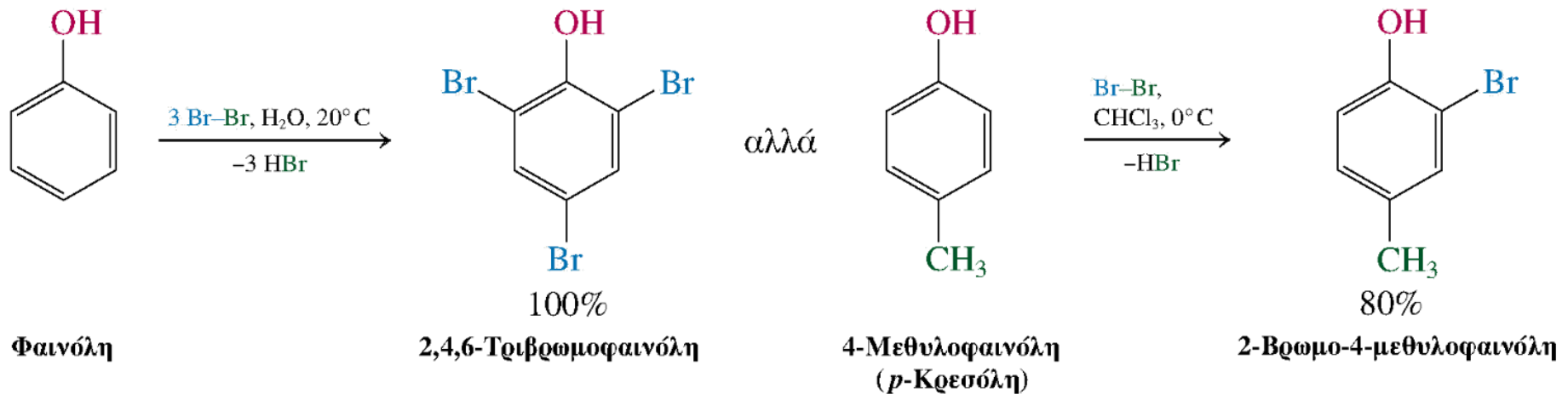
Βενζοϋλοχλωρίδιο

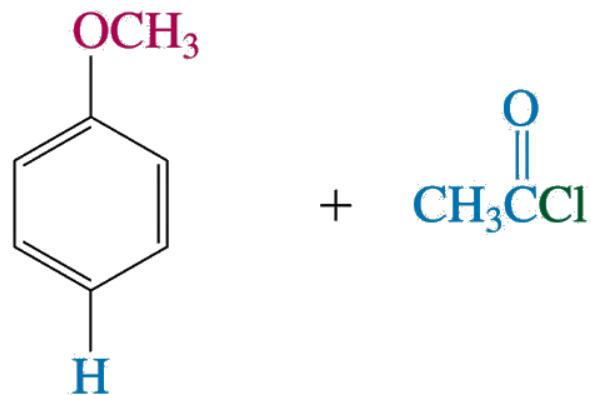
Βενζοϊκό φαινύλιο
(96%)

Ηλεκτρονιόφιλη υποκατάσταση στις φαινόλες

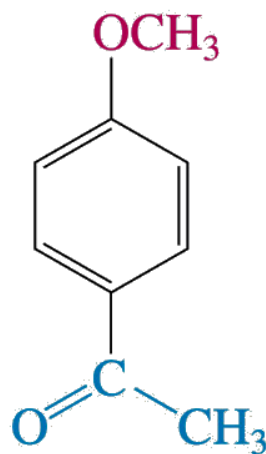


Αλογόνωση φαινολών





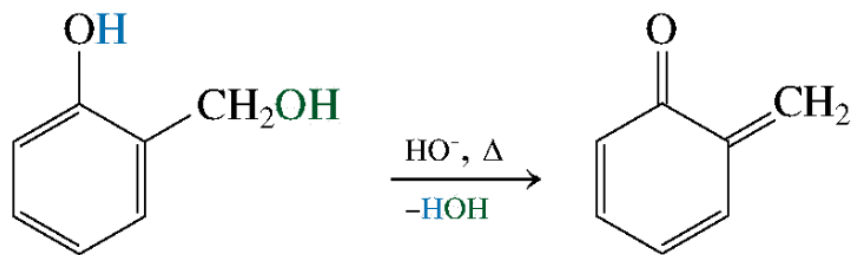
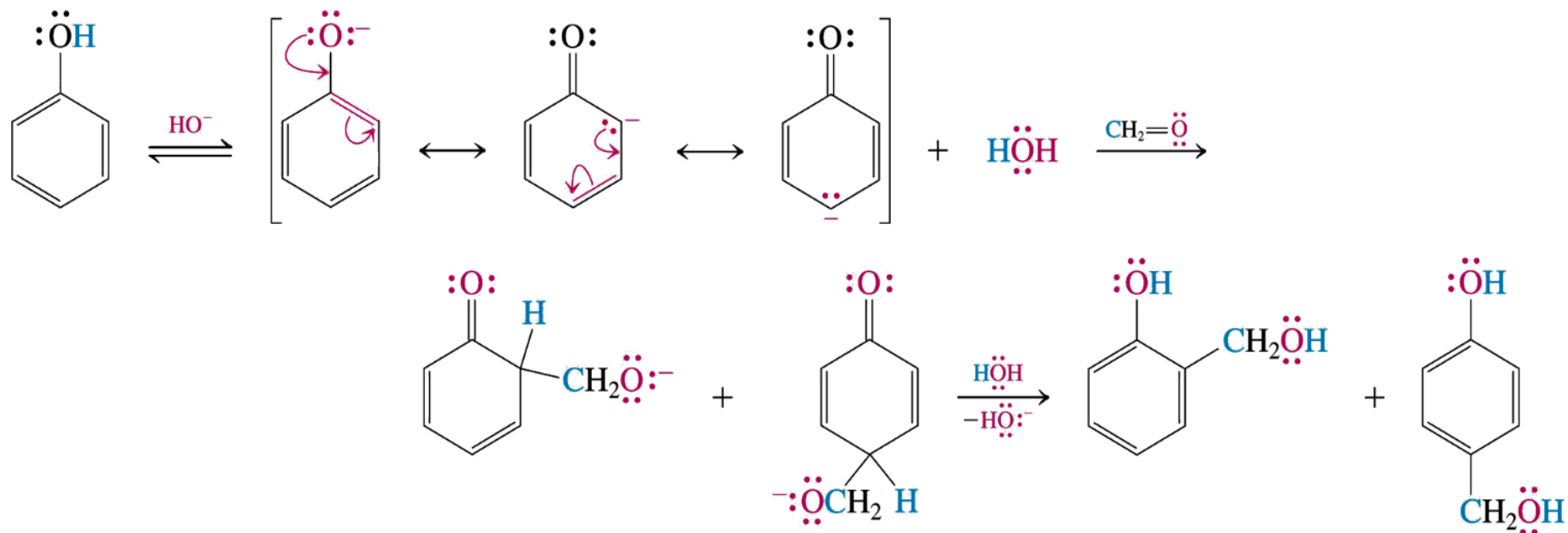
Μεθοξυβενζόλιο
(Ανισόλη)



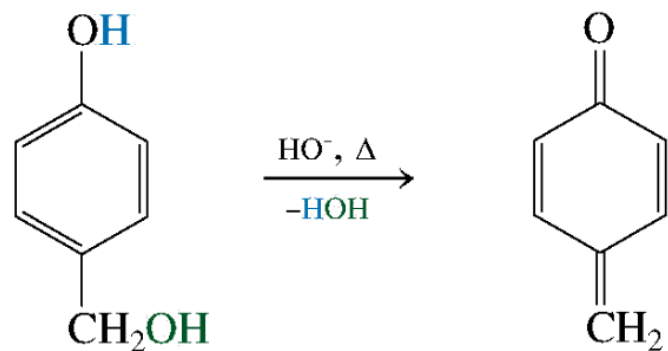
70%

1-(4-Μεθοξυφαινυλ)αιθανόνη
(*p*-Μεθοξυακετοφαινόνη)

Υδροξυμεθυλίωση της φαινόλης

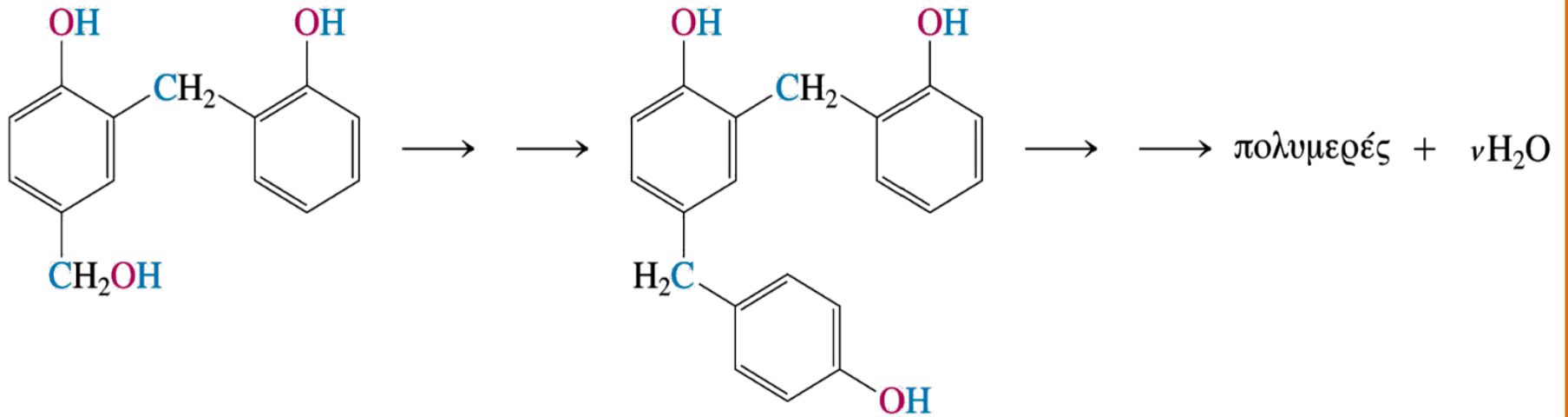
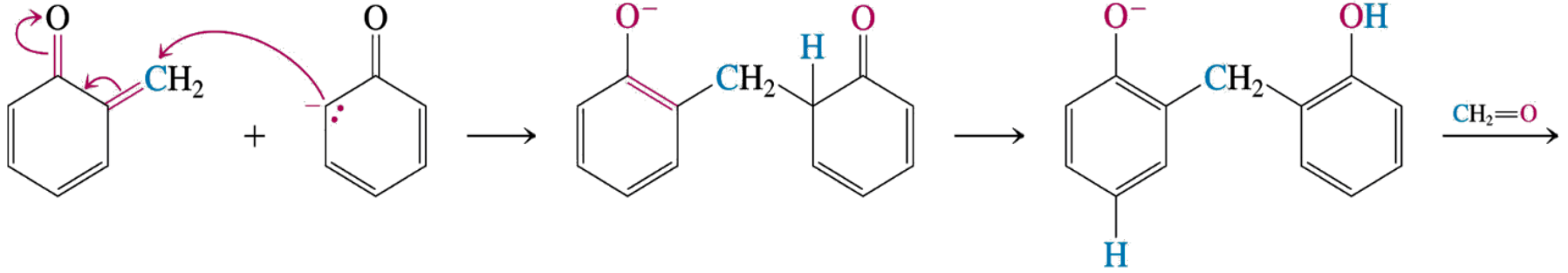


o-Κινομεθάνιο

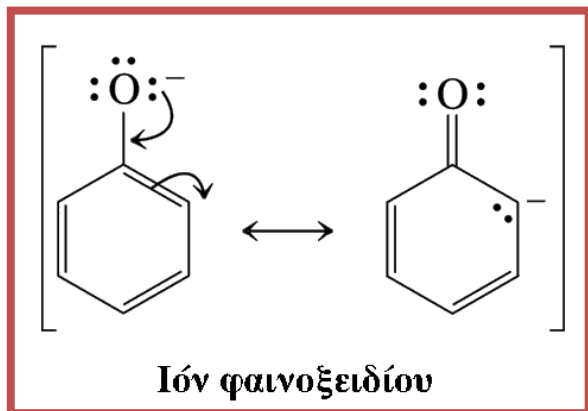
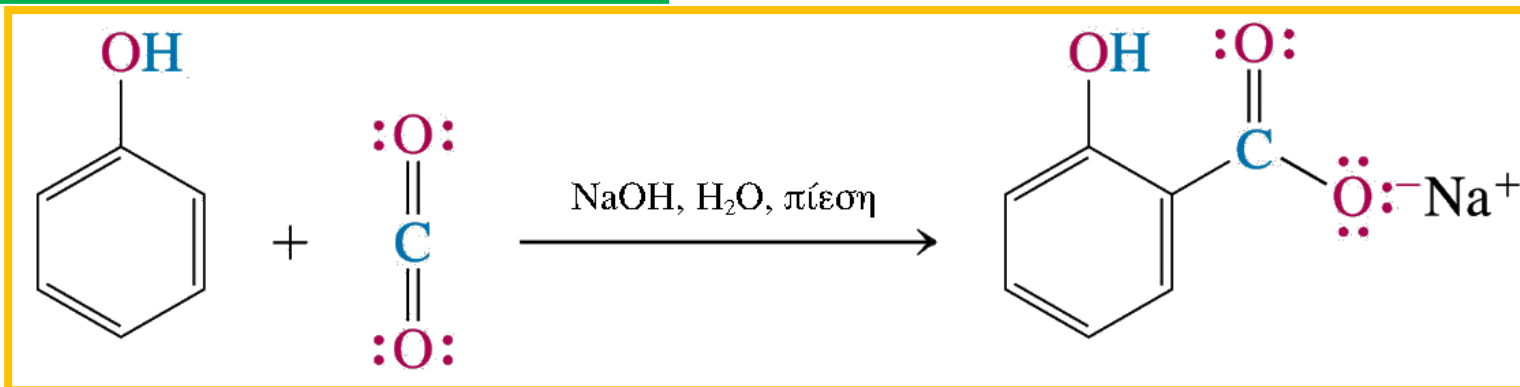


p-Κινομεθάνιο

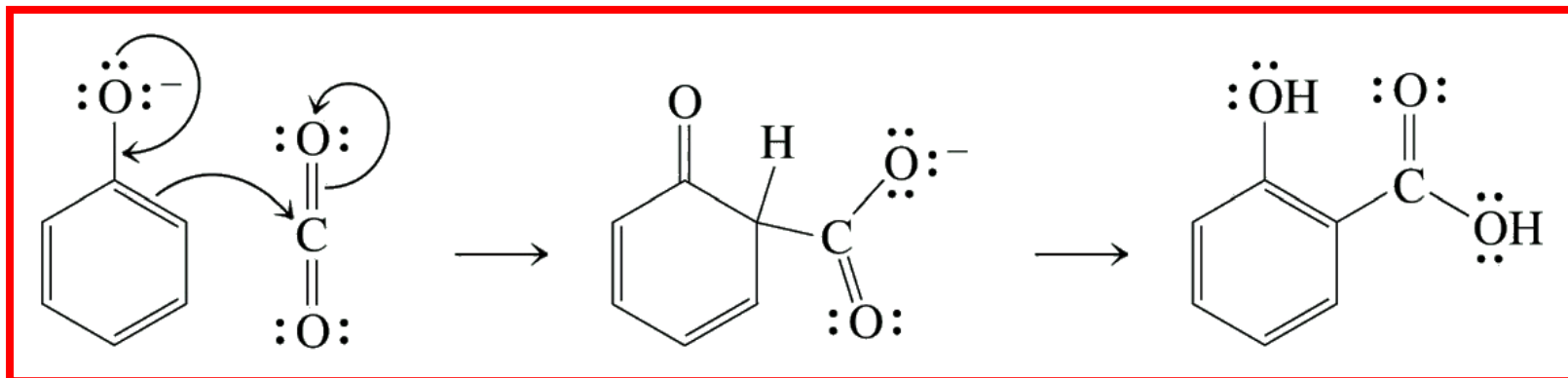
Σύνθεση φαινολικής ρητίνης



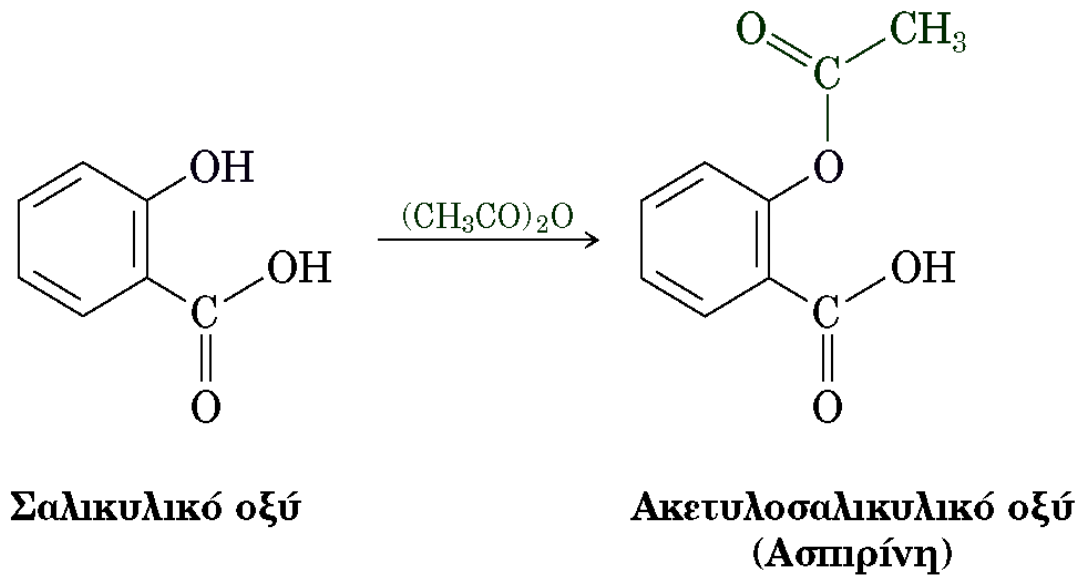
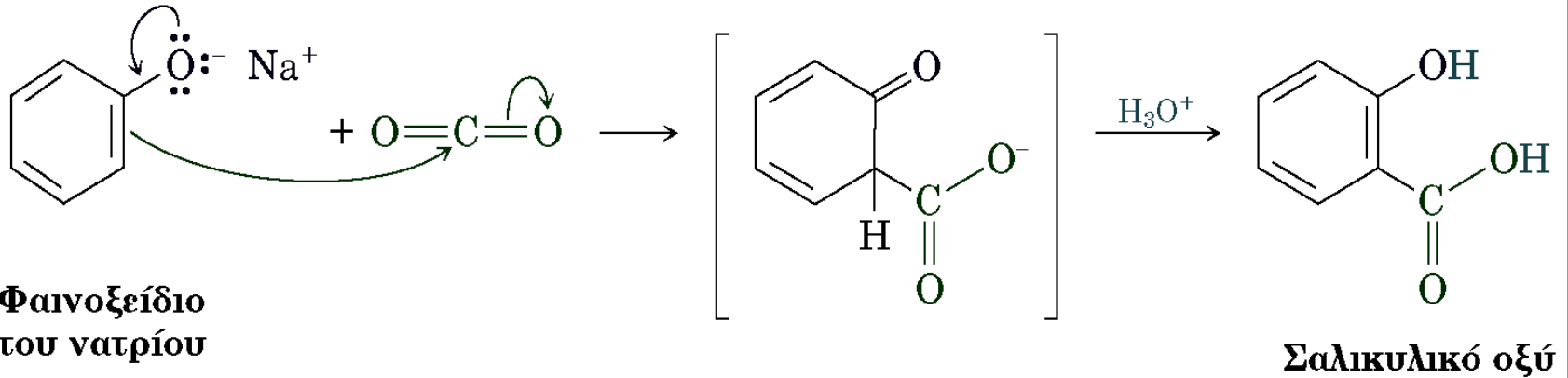
Αντίδραση Kolbe- Schmidt

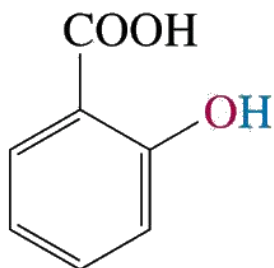


Κυρίως το ο-ισομερές

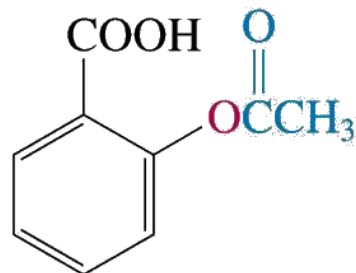
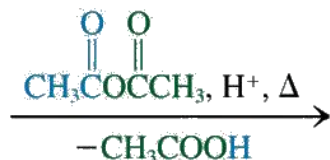


Ασπιρίνη

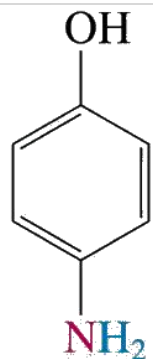
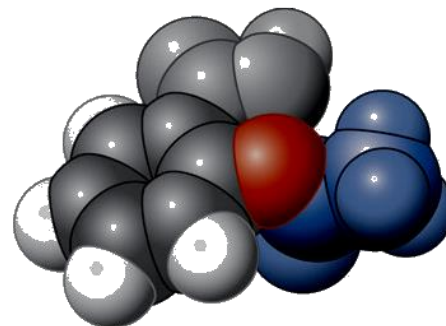




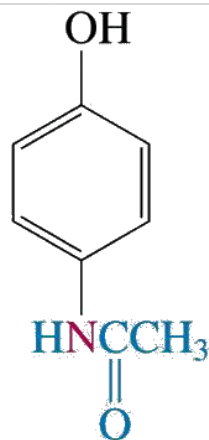
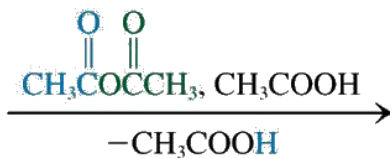
2-Υδροξυβενζοϊκό οξύ
(o-Υδροξυβενζοϊκό οξύ,
σαλικυλικό οξύ)



2-Ακετυλοξυβενζοϊκό οξύ
(o-Ακετοξυβενζοϊκό οξύ,
ακετυλοσαλικυλικό οξύ, ασπιρίνη)

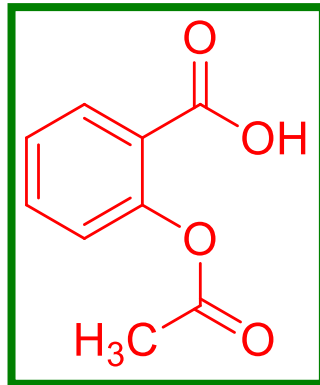


4-Αμινοφαινόλη
(p-Αμινοφαινόλη)

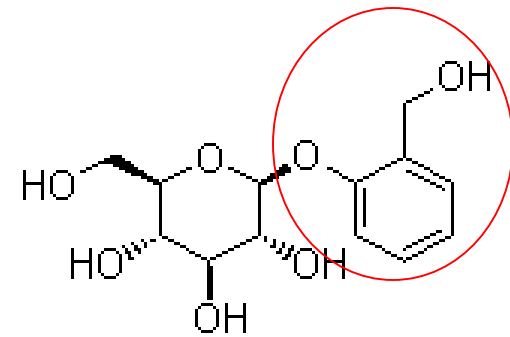


N-(4-Υδροξυφαινυλ)ακεταμίδιο
[N-(p-Υδροξυφαινυλ)ακεταμίδιο, ακεταμινοφαίνη, (Tylenol)]

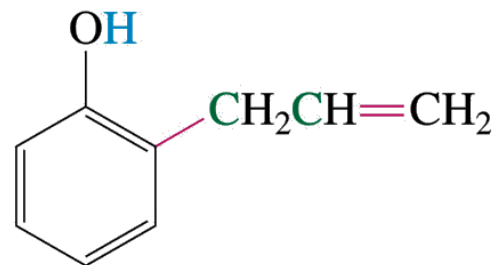
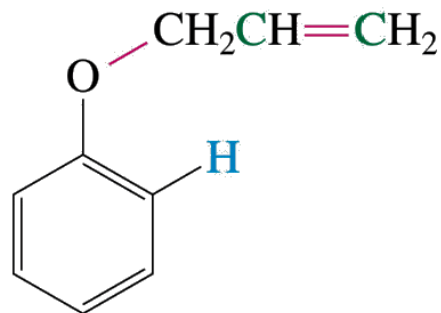
Ασπιρίνη



Σαλικίνη



Μετάθεση Claisen

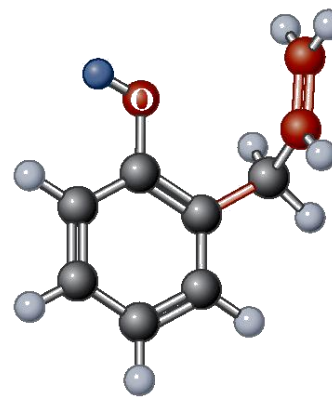
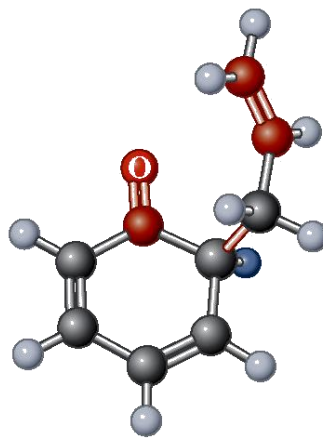
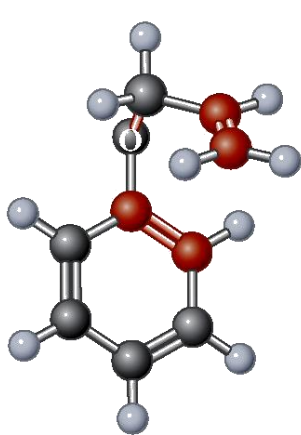
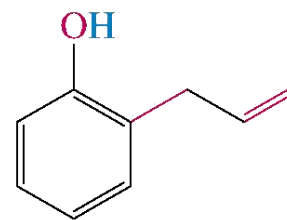
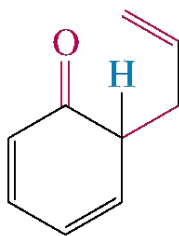
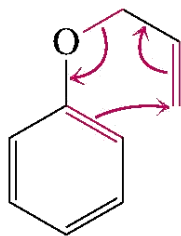


75%

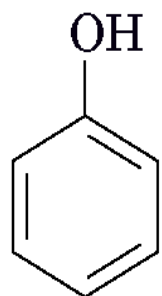
2-Προπενυλοξυβενζόλιο
(Αλλυλοφαινυλαιθέρας)

2-(2-Προπενυλο)φαινόλη
(*ο*-Αλλυλοφαινόλη)

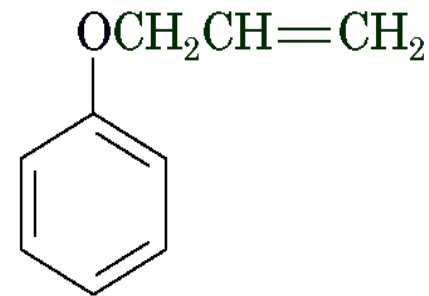
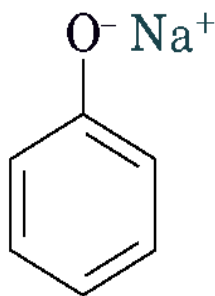
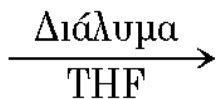
Μηχανισμός της μετάθεσης Claisen



6-(2-Προπενυλο)-
2,4-κυκλοεξαδιενόνη



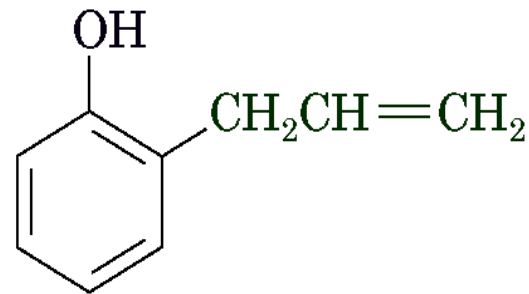
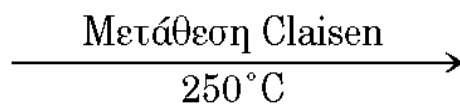
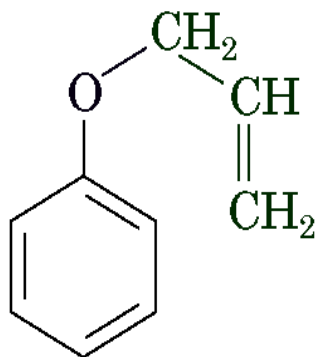
+ NaH



Φαινόλη

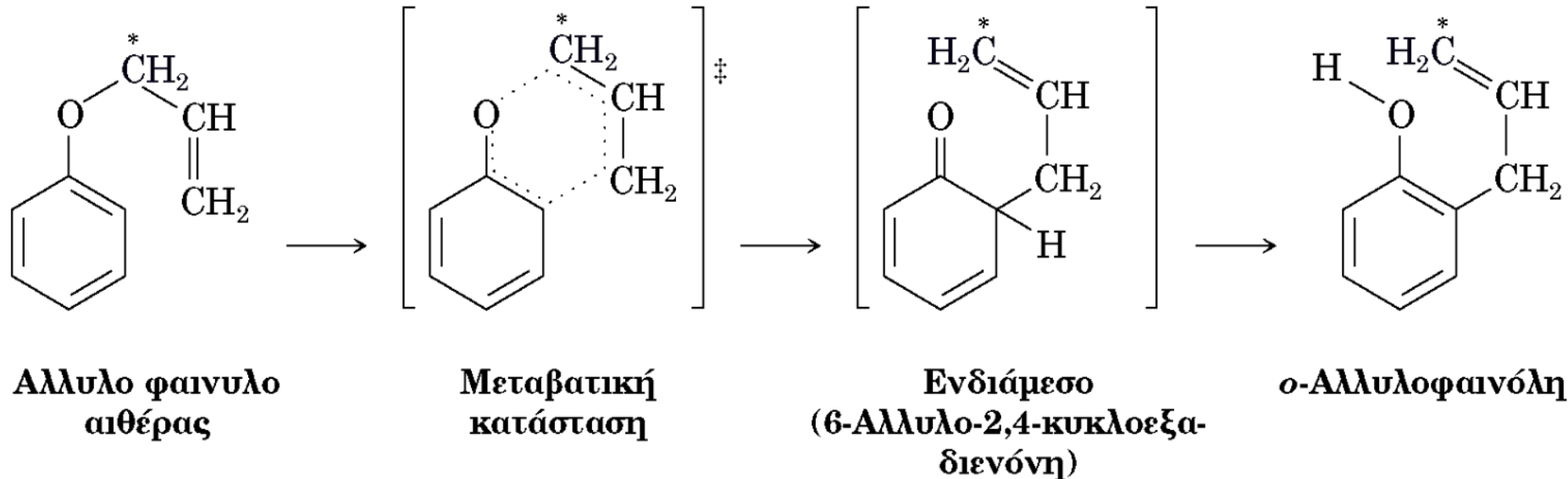
**Φαινοξείδιο
του νατρίου**

**Αλλυλο
φαινυλο αιθέρας**

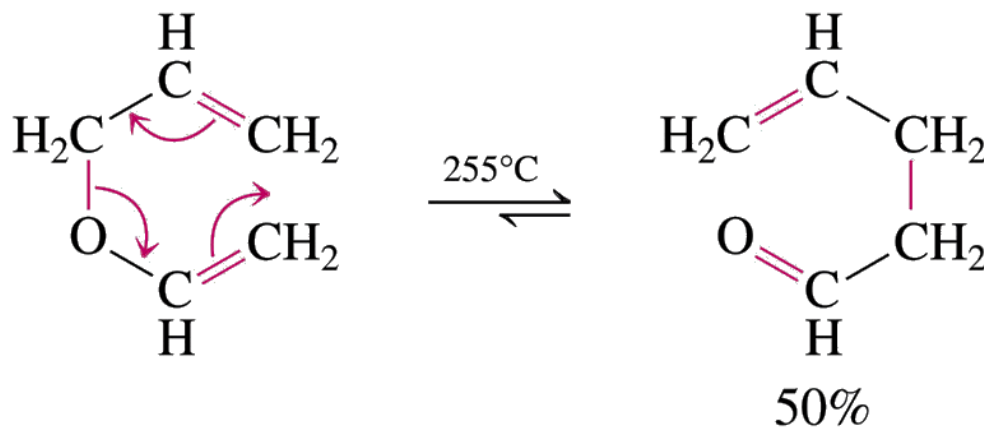


Αλλυλο φαινυλο αιθέρας

ο-Αλλυλοφαινόλη



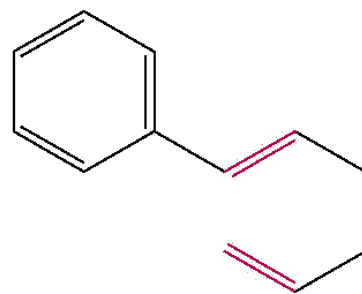
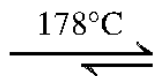
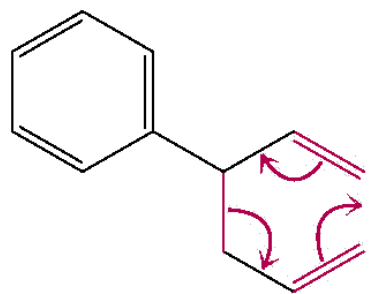
Αλειφατική μετάθεση Claisen



1-Αιθενυλοξυ-2-προπένιο
(Αλλυλοβινυλαιθέρας)

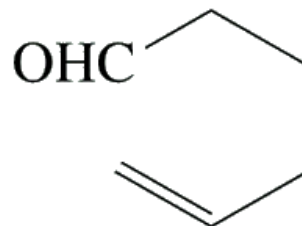
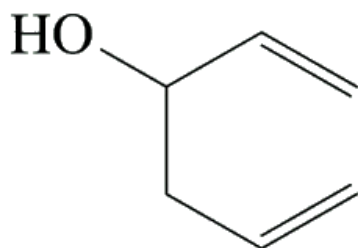
4-Πεντενάλη

Μετάθεση Core

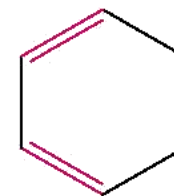
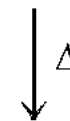
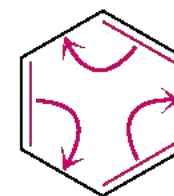


72%

trans-1-Φαινυλο-1,5-εξαδιένιο

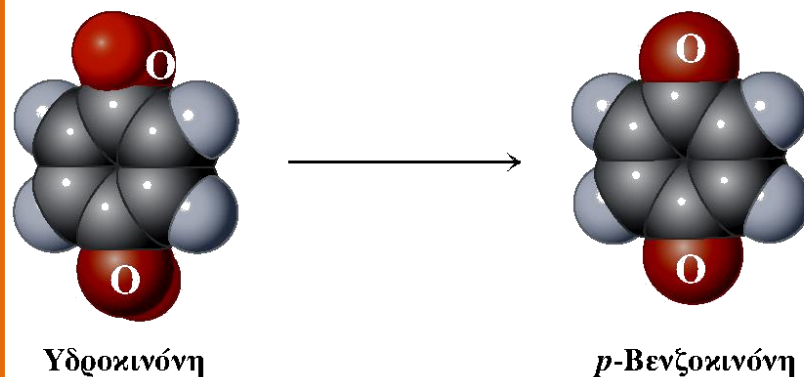
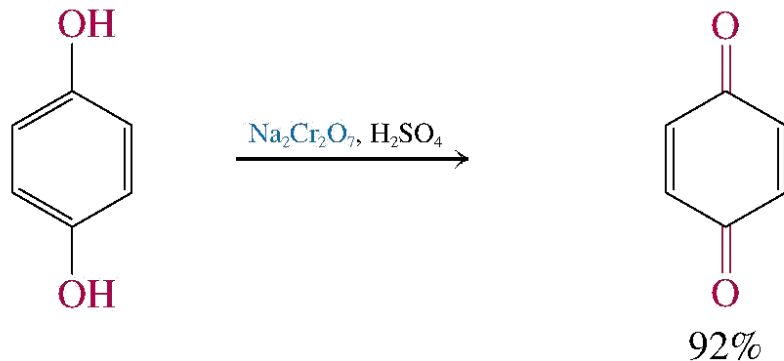
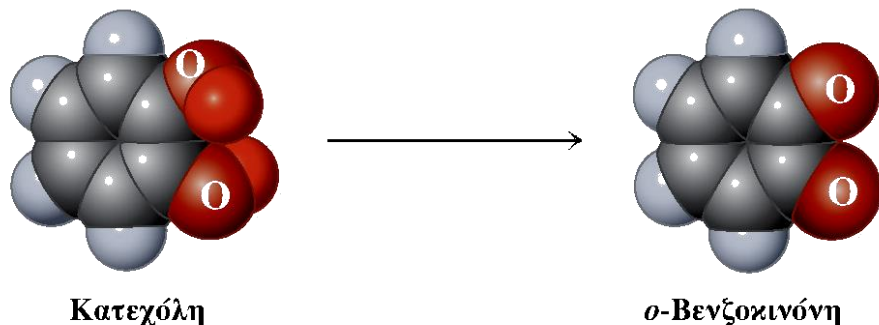
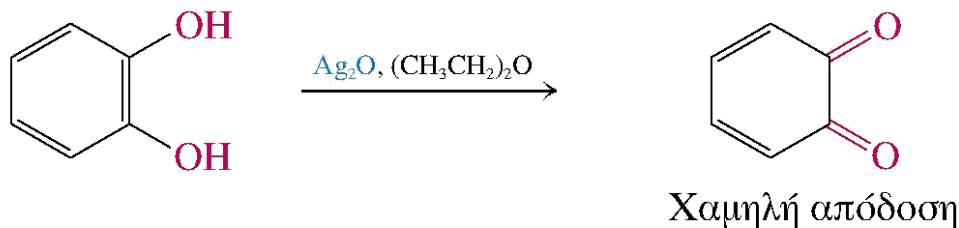


Ηλεκτροκυκλική αντίδραση του *cis*-1,3,5-εξατριενίου

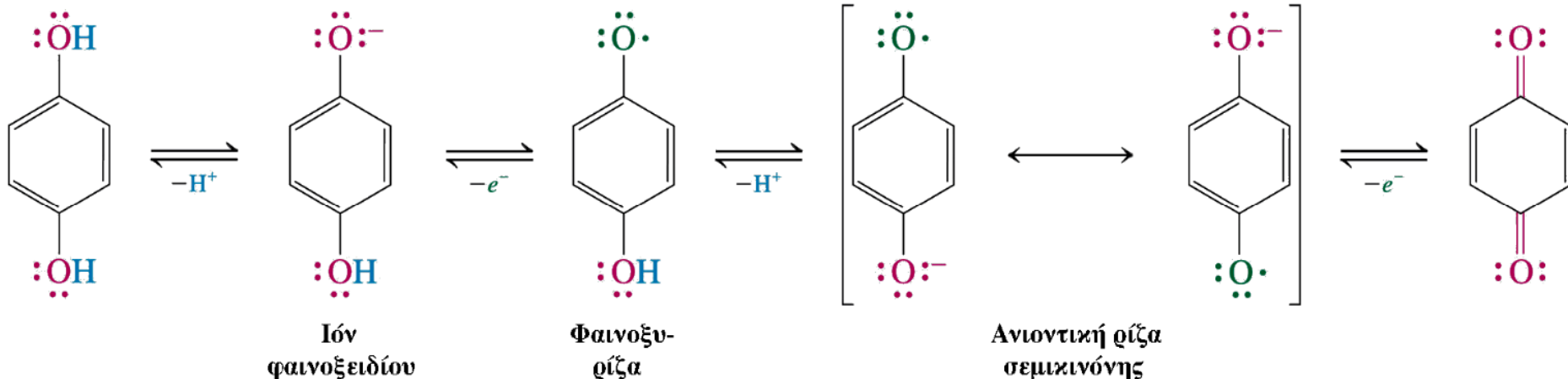


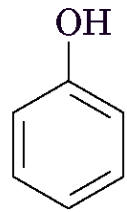
Οξείδωση φαινολών προς κινόνες

Βενζοκινόνες από την οξείδωση των βενζολοδιολών

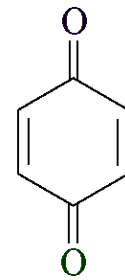
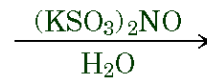


Οξειδοαναγωγική σχέση μεταξύ *p*-βενζοκινόνης και υδροκινόνης

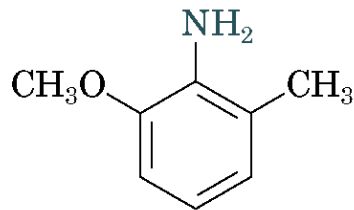




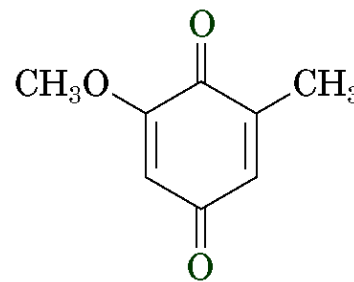
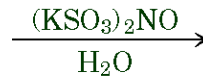
Φαινόλη



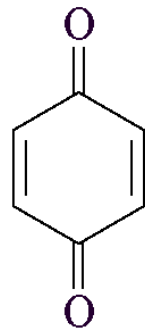
Βενζοκινόνη (79%)



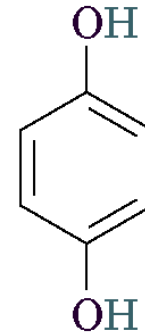
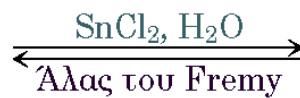
2-Μεθυλο-6-μεθοξυανιλίνη



2-Μεθυλο-6-μεθοξυβενζοκινόνη
(96%)

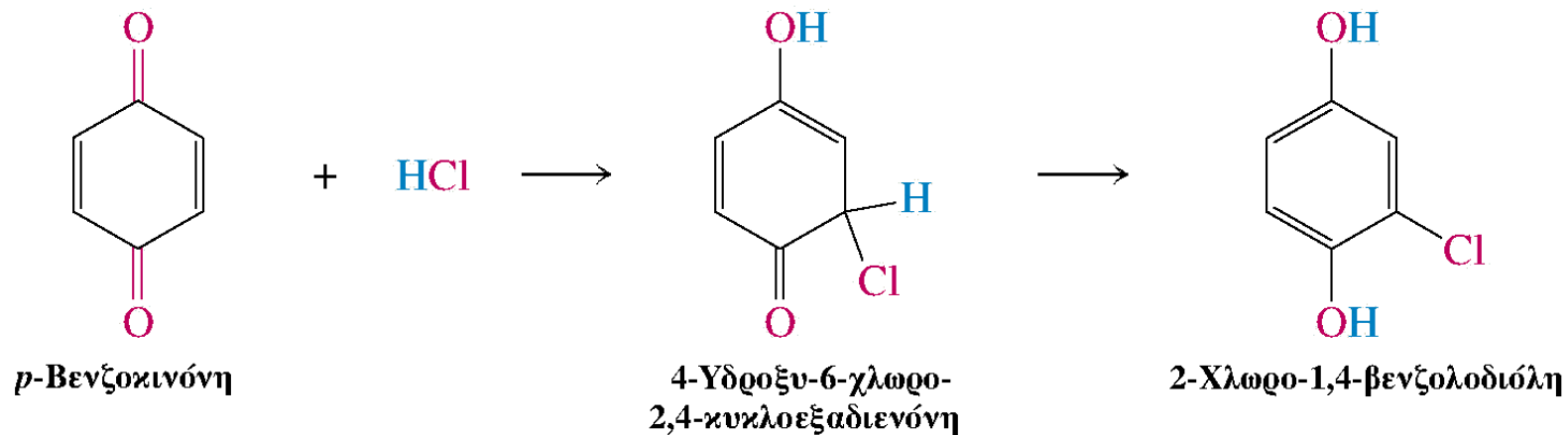
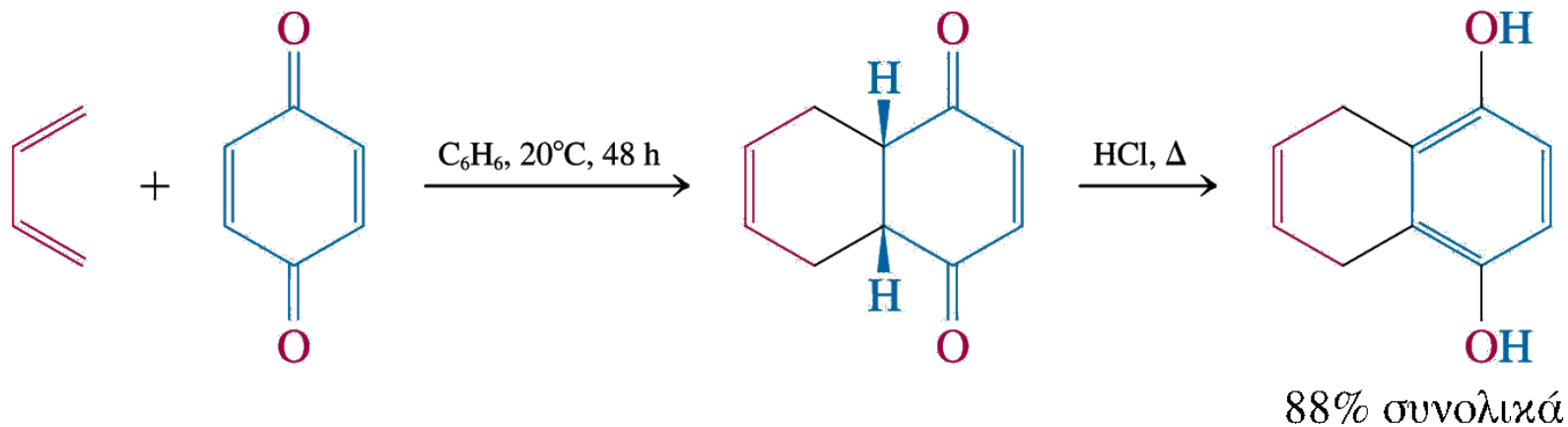


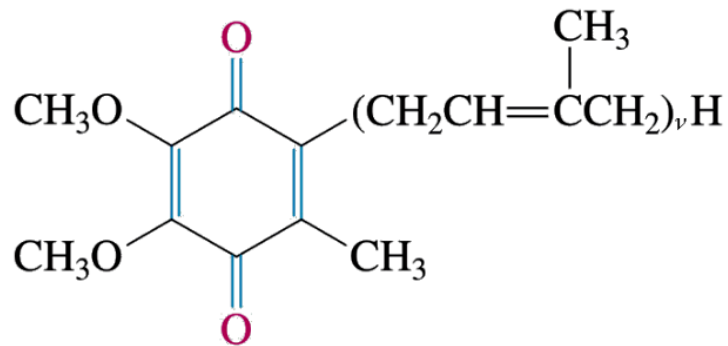
Βενζοκινόνη



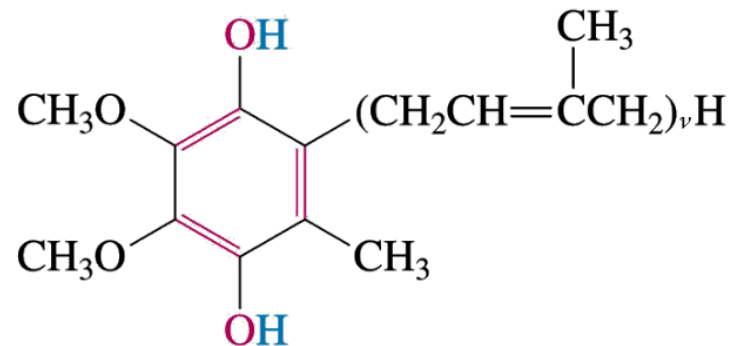
Υδροκινόνη

Αντιδράσεις Diels-Alder της *p*-βενζοκινόνης





Ουβικινόνες ($n = 6, 8, 10$)
(Συνένζυμο Q)



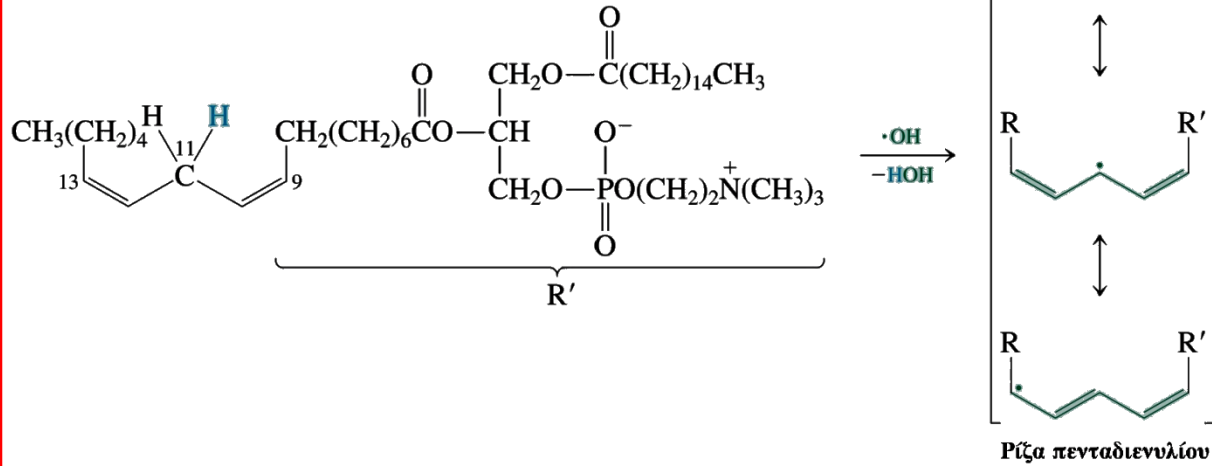
Ανηγμένη μορφή του συνενζύμου Q
(Ανηγμένο Q, ή QH₂)

Χρήση στη μετατροπή του O₂ στα βιοχημικά συστήματα.

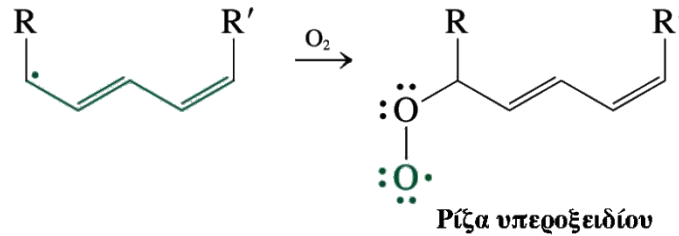


Οι φαινόλες ως αντιοξειδωτικά

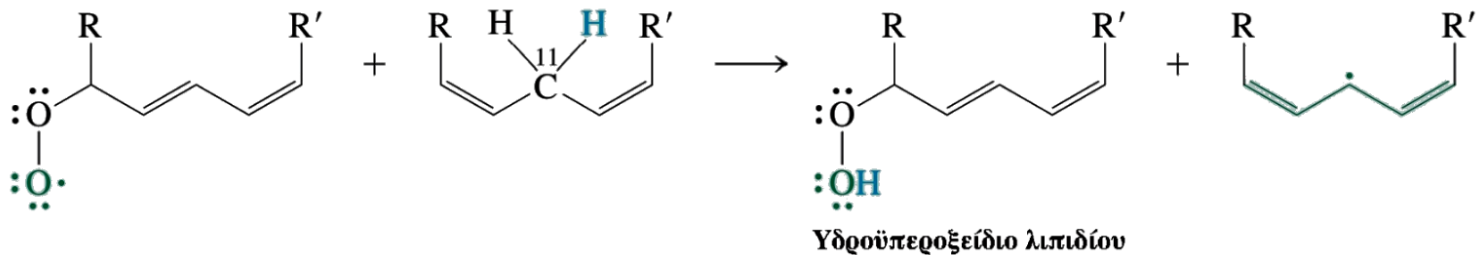
Στάδιο έναρξης



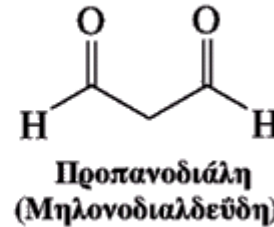
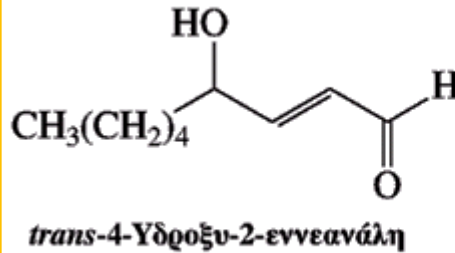
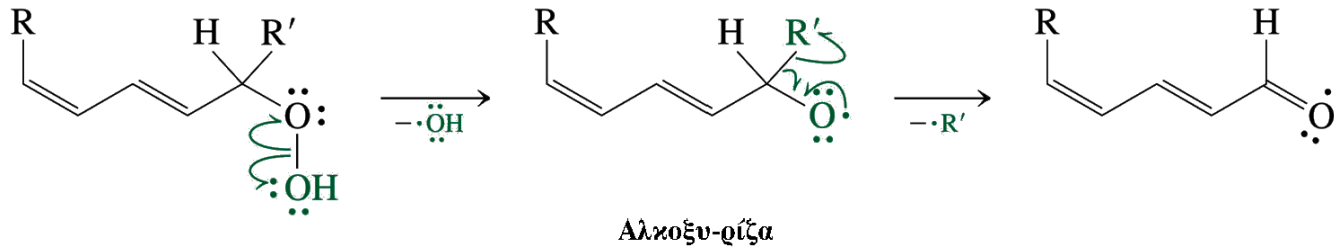
Στάδιο διάδοσης 1



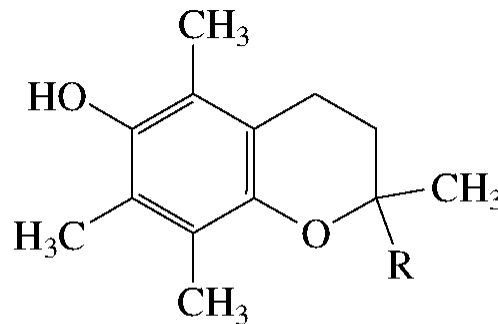
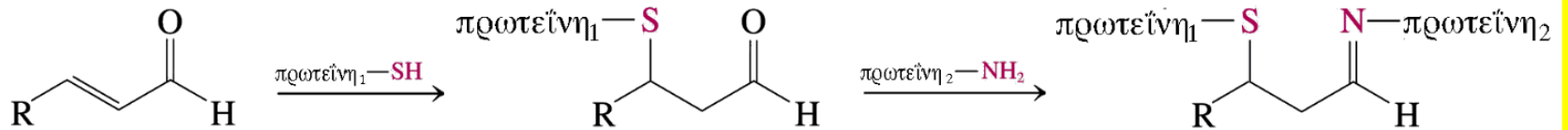
Στάδιο διάδοσης 2



β-Σχάση μιας αλκοξυ-ρίζας λιπιδίου



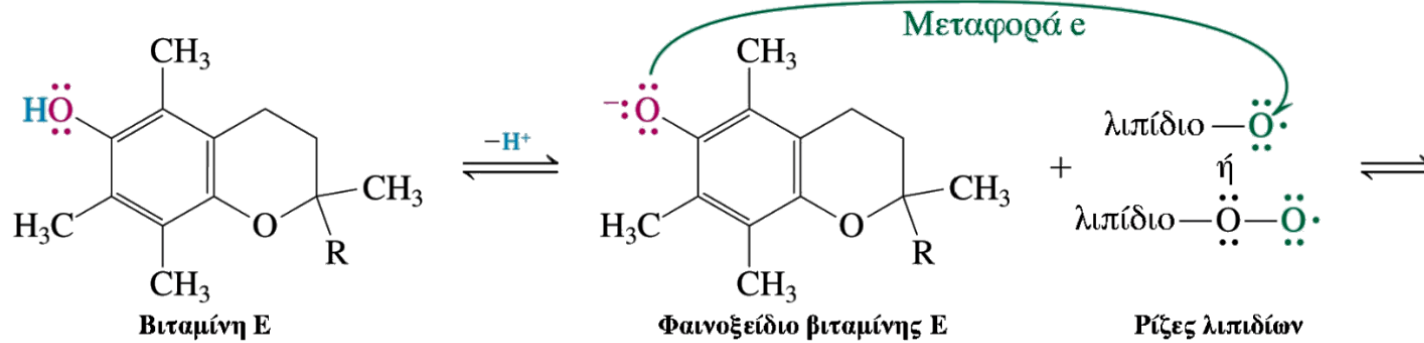
Διασταυρούμενες συνδέσεις πρωτεϊνών κατά την αντίδρασή τους με ακόρεστες αλδεϋδες



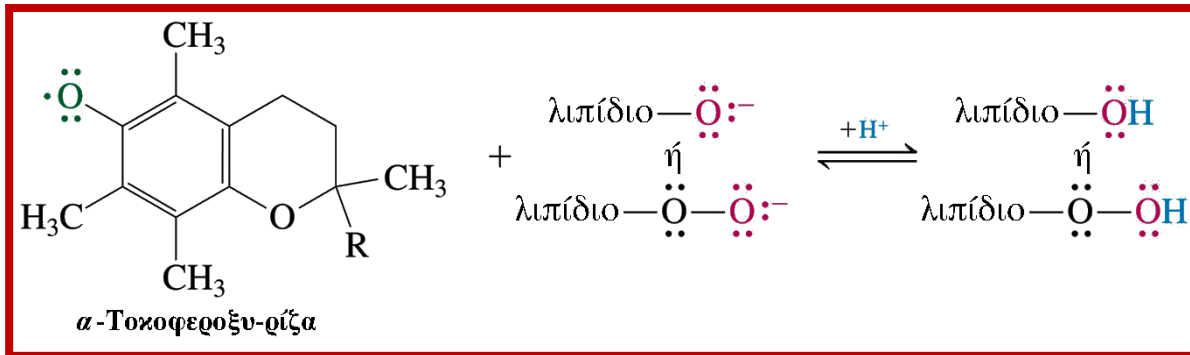
Βιταμίνη E
(*α*-Τοκοφερόλη)

R = Διακλαδισμένη αλυσίδα C₁₆H₃₃

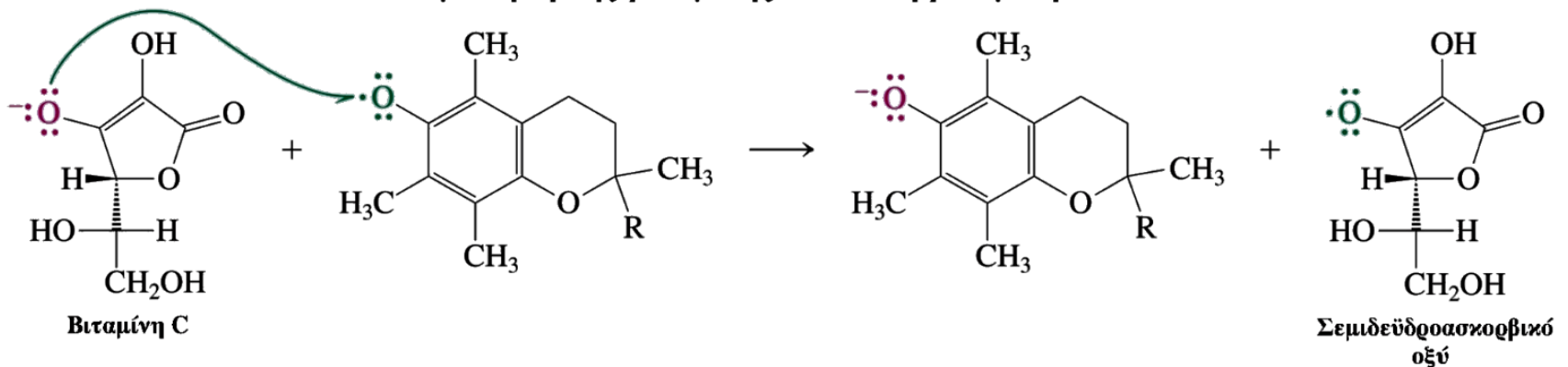
Αντιδράσεις της βιταμίνης E με υδροϋπεροξυ- και αλκοξυ-ρίζες λιπιδίων



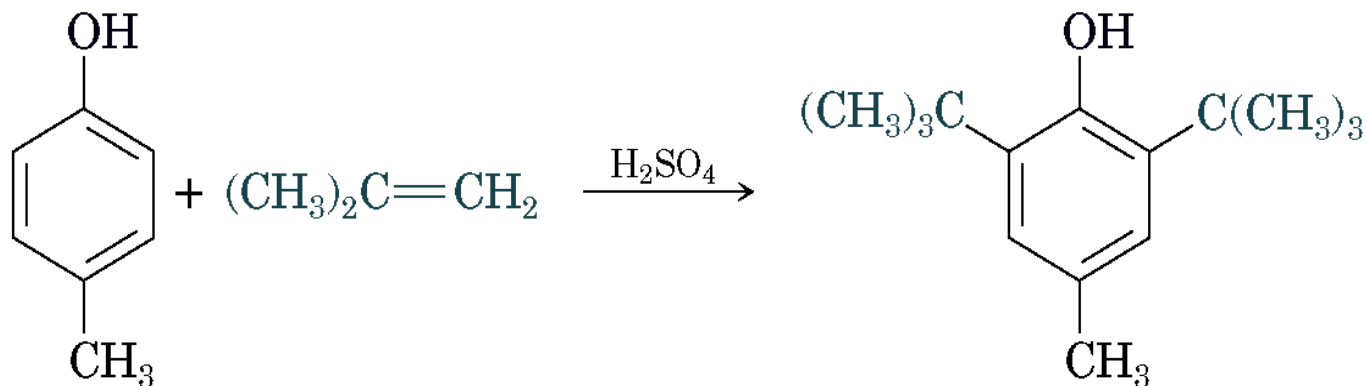
Ανάγει τις ρίζες που δημιουργούνται



Αναγέννηση της βιταμίνης E από τη βιταμίνη C



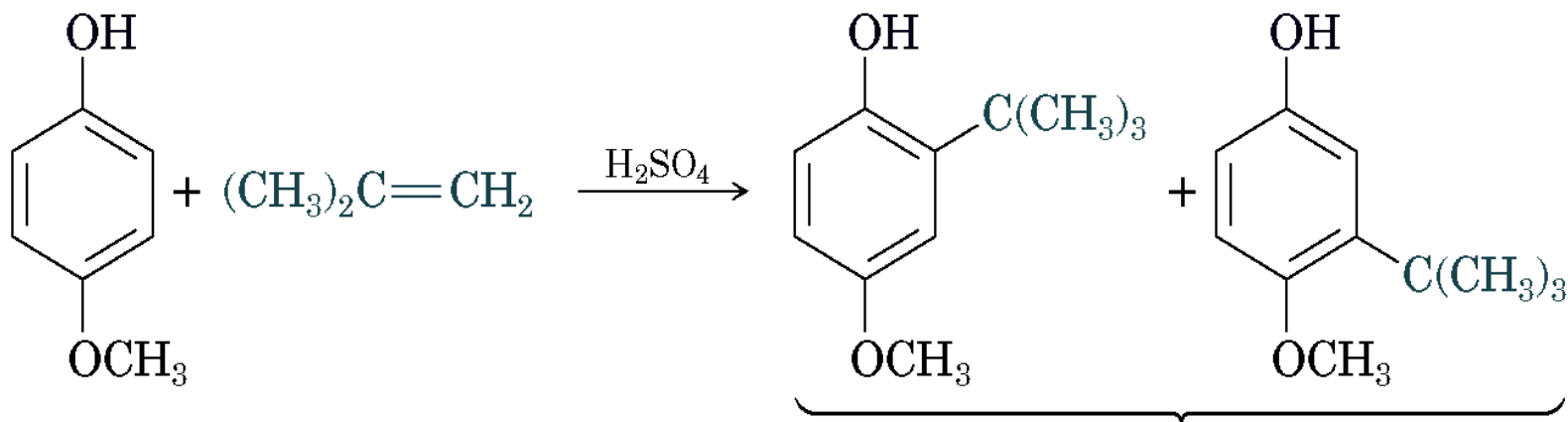
Συνθετικά ανάλογα της βιταμίνης Κ ως συντηρητικά τροφίμων



p-Μεθυλοφαινόλη

BHT

ANTIOΞΕΙΔΩΤΙΚΑ



p-Μεθοξυφαινόλη

BHA