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Fontes bibliográficas:

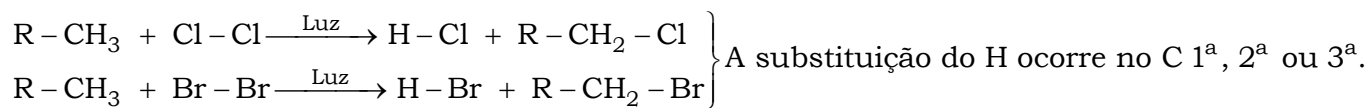
Química Orgânica – Volume 4: Feltre – Setsuo

Química Orgânica – Volumes 1 e 2: McMurry.

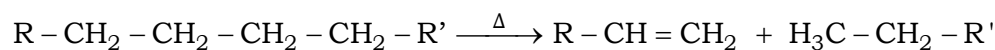
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AS REAÇÕES ORGÂNICAS DOS VESTIBULARES

1) Alcanos ou parafinas

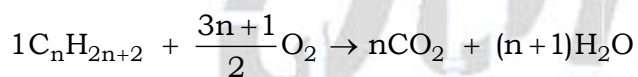
Halogenação



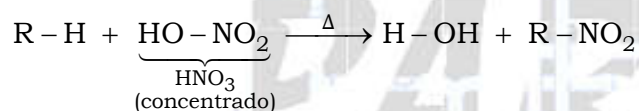
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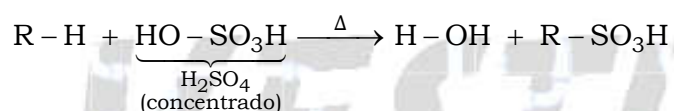
Combustão



Nitração



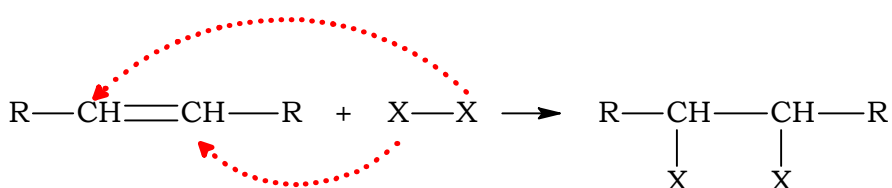
Sulfonação



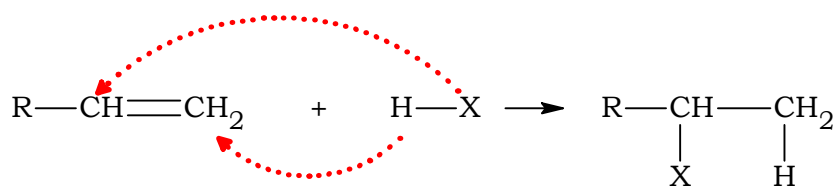
2) Alcenos ou alquenos ou olefinas

Reação com halogênios

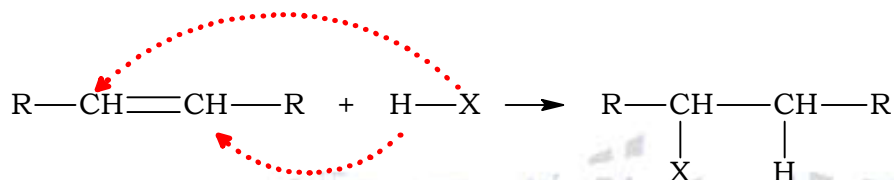
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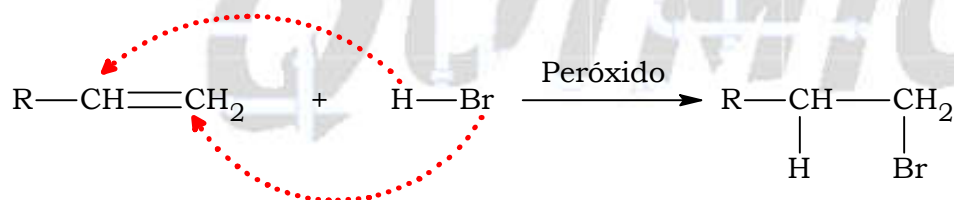
Reação com HX



Regra de Markownikoff: o "H" entra no carbono mais hidrogenado

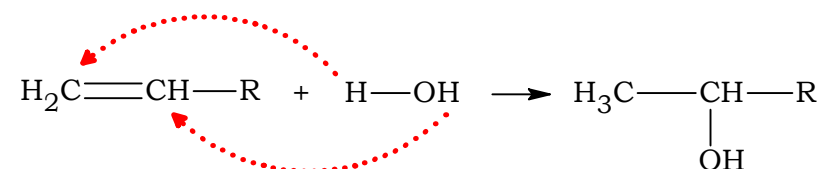
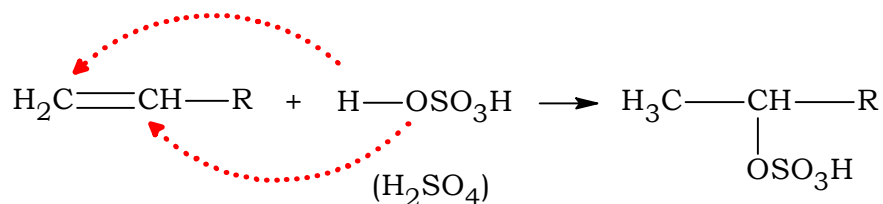
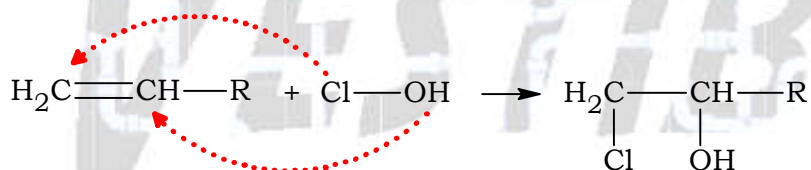
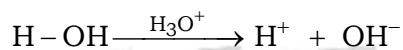
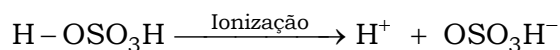
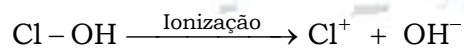


Reação de Karasch: em presença de peróxidos

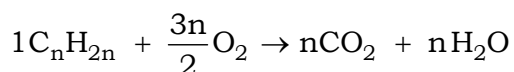


O "H" entra no carbono menos hidrogenado.

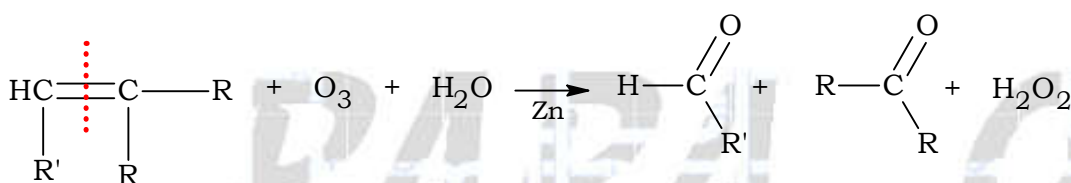
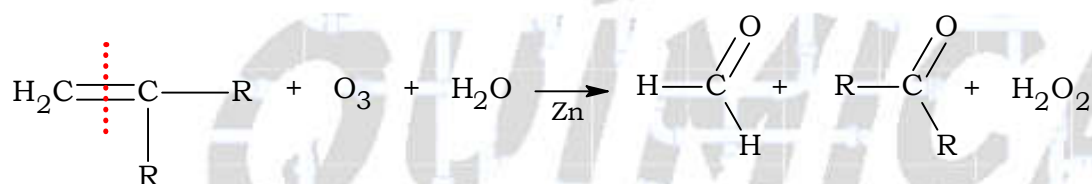
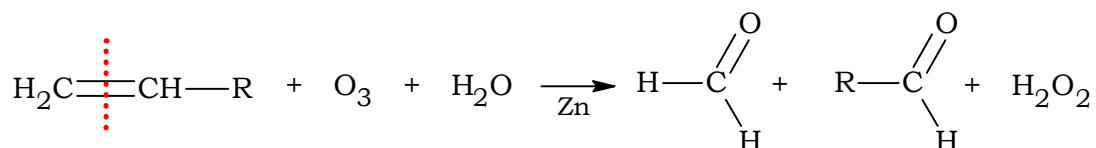
Rações com HClO, H₂SO₄ e H₂O



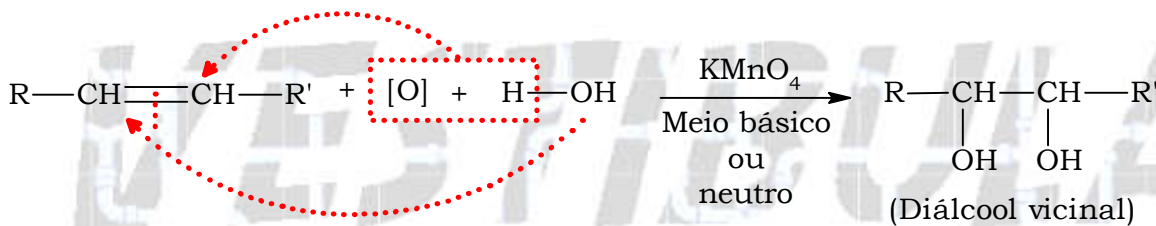
Combustão



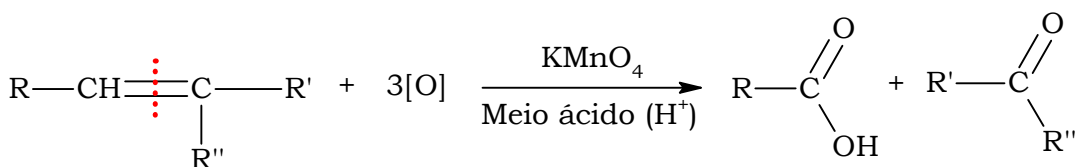
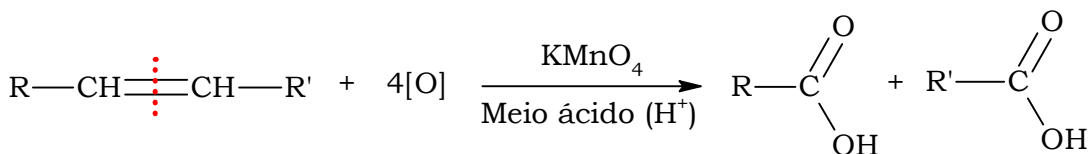
Ozonólise seguida de hidrólise (Reações globais)

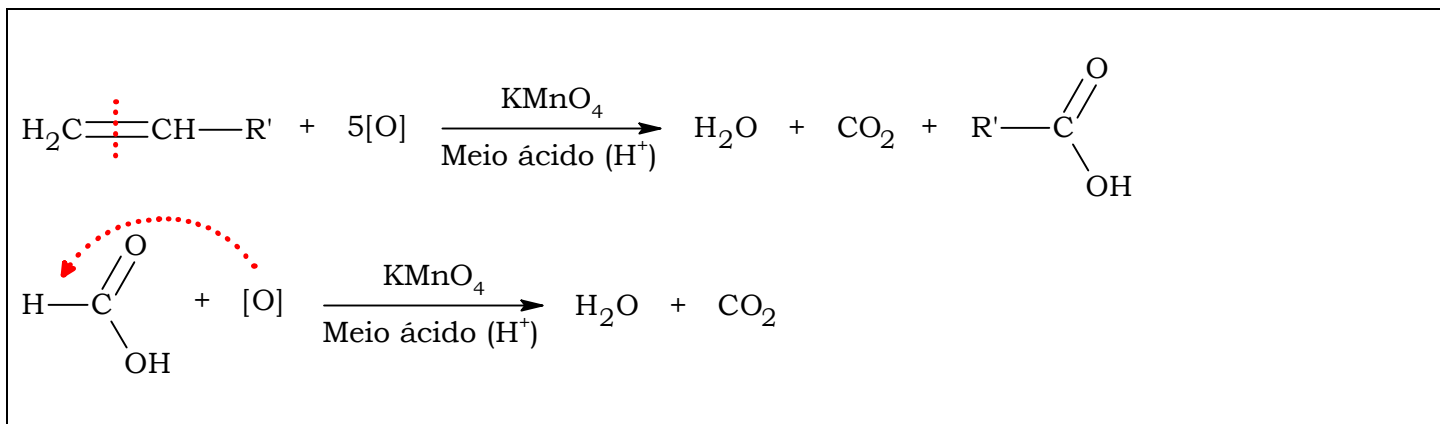


Reação com $KMnO_4$ em meio básico ou neutro – Oxidação branda



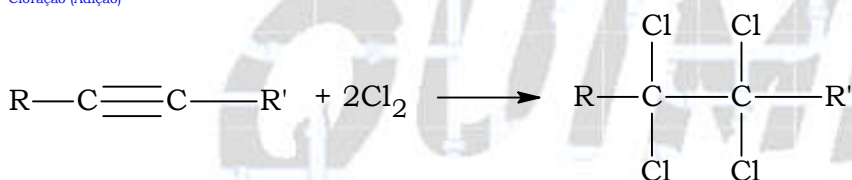
Reação com $KMnO_4$ em meio ácido – Oxidação enérgica ou energética



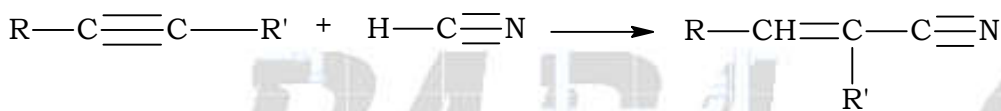


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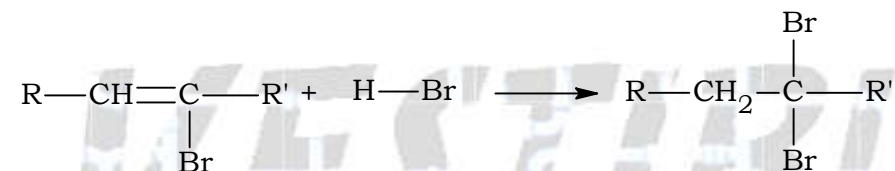
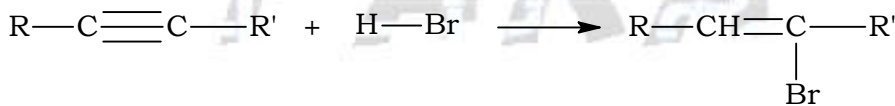
Cloração (Adição)



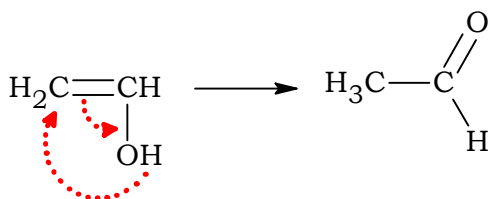
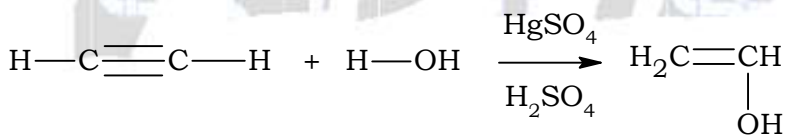
Reação com HCN (Adição)



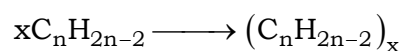
Reações com HX



Hidratação de alcinos

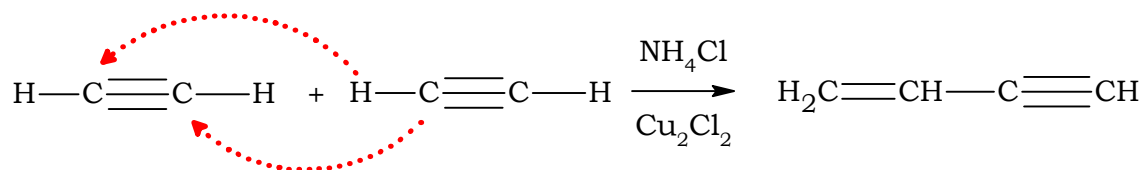


Polimerização

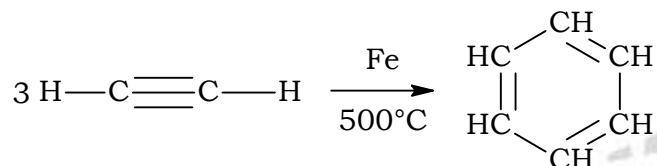


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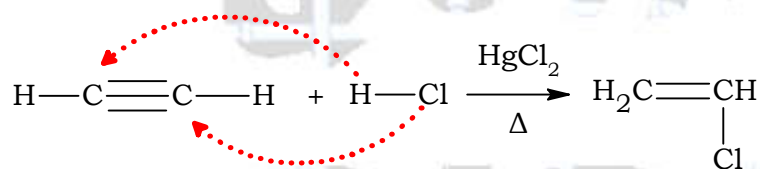
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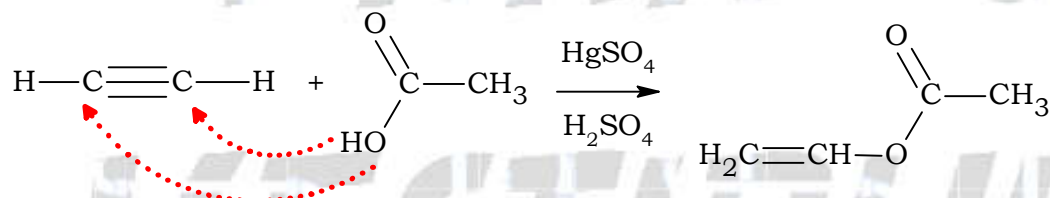
Trimerização



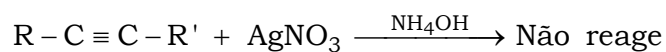
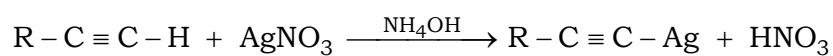
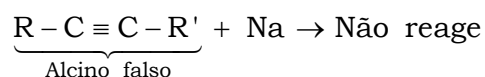
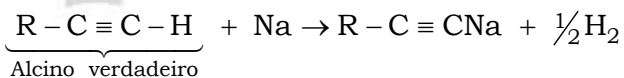
Obtenção do cloreto de vinila (monômero na obtenção do PVC)



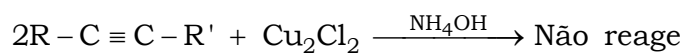
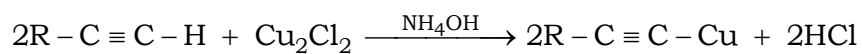
Obtenção do acetato de vinila (monômero na obtenção do PVA)



Reações com alcinos verdadeiros e falsos

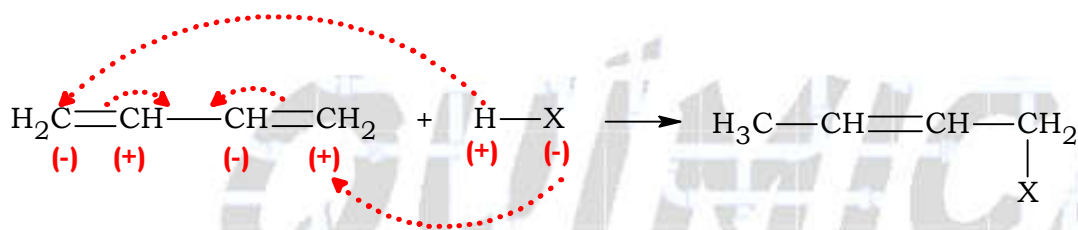


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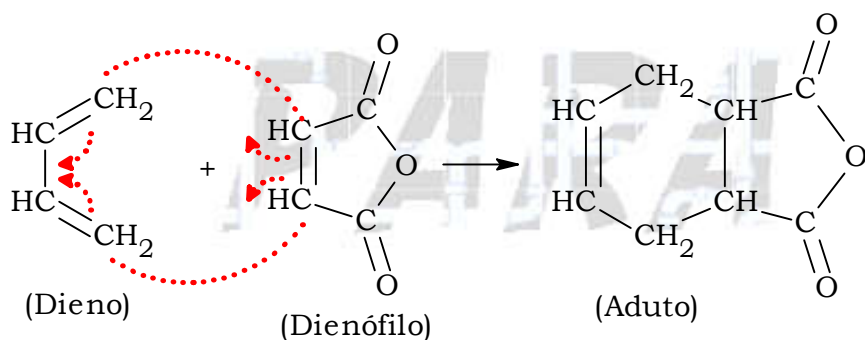


4) Alcadienos

Adição

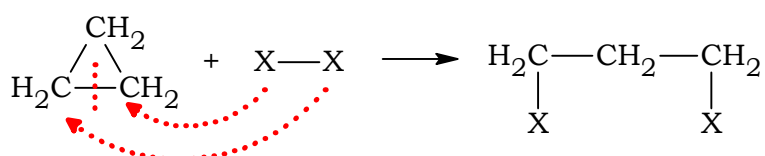
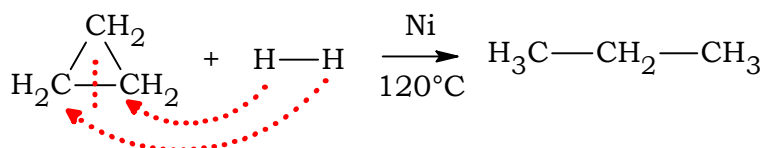


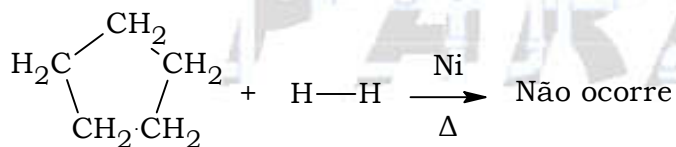
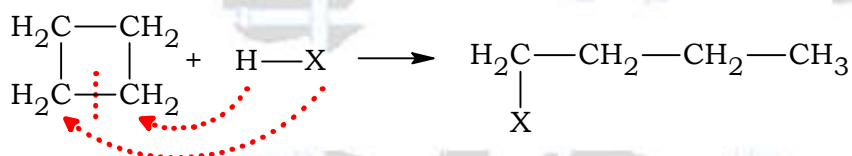
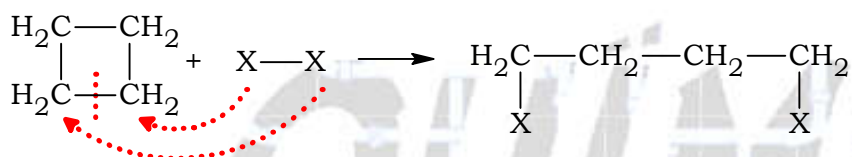
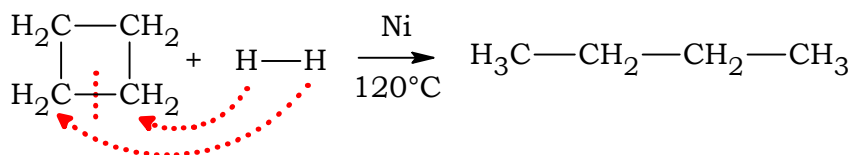
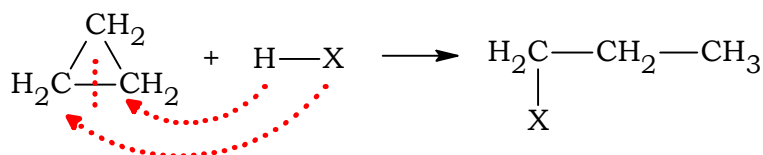
Reação de Diels-Alder



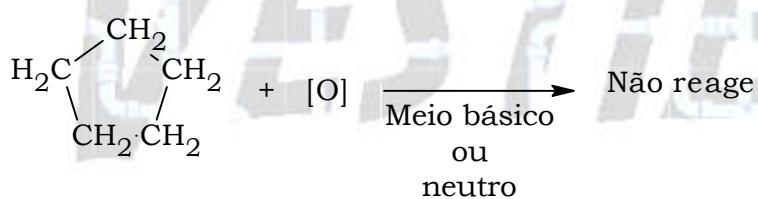
5) Cicloalcanos

Adição

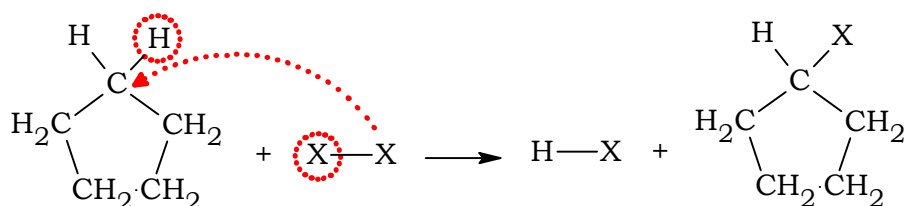




Oxidação

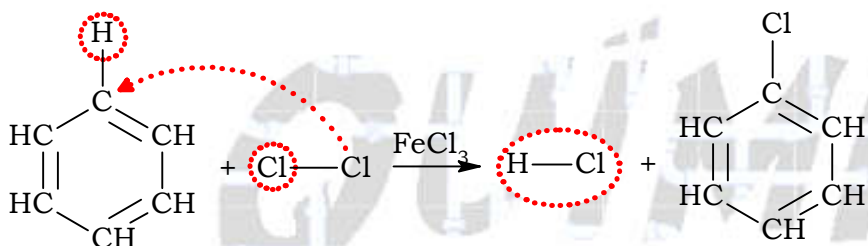
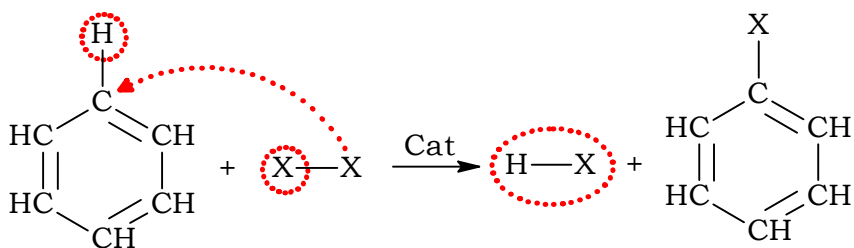


Substituição

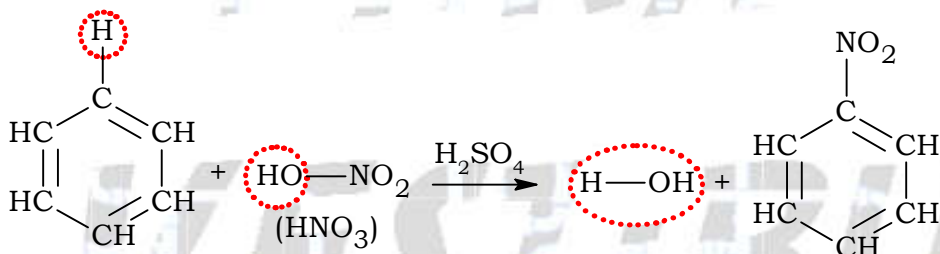
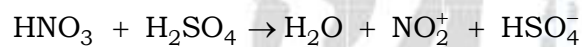


6) Hidrocarbonetos aromáticos

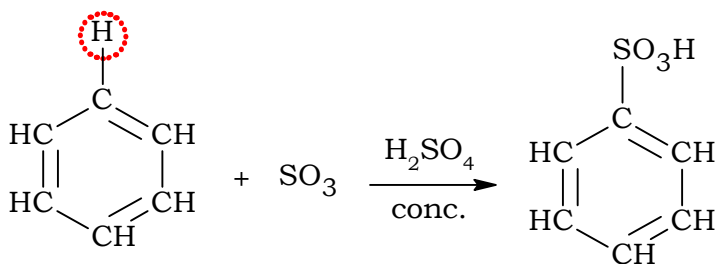
Halogenação



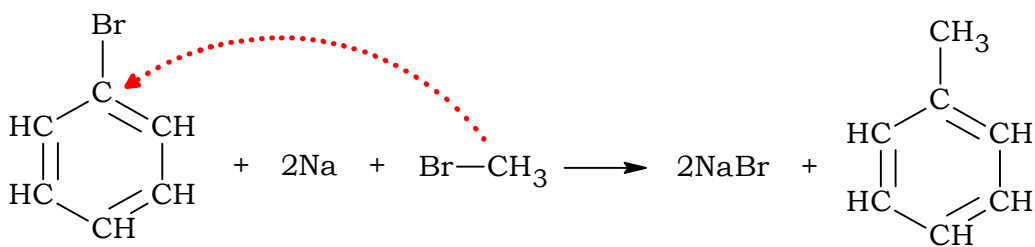
Nitração



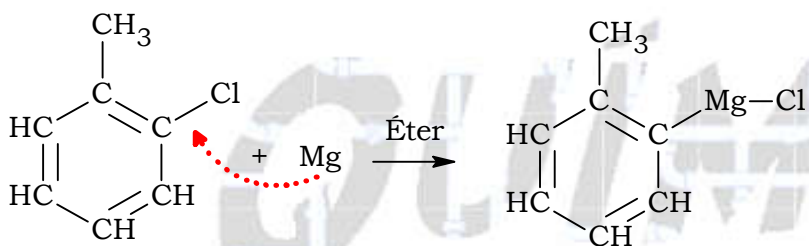
Sulfonação



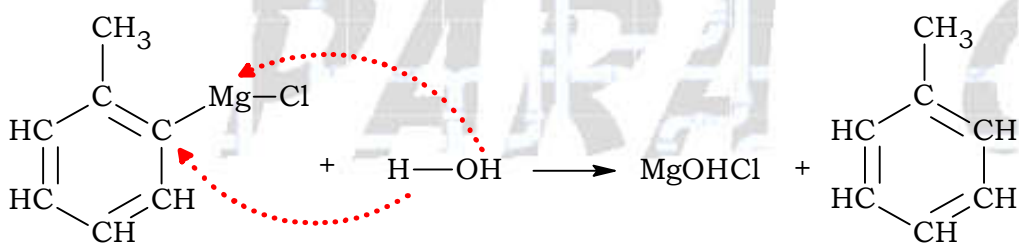
Síntese de Fittig-Wurtz



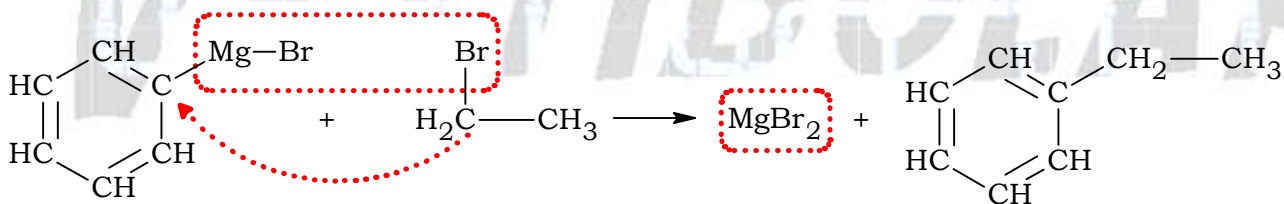
Síntese de Grignard



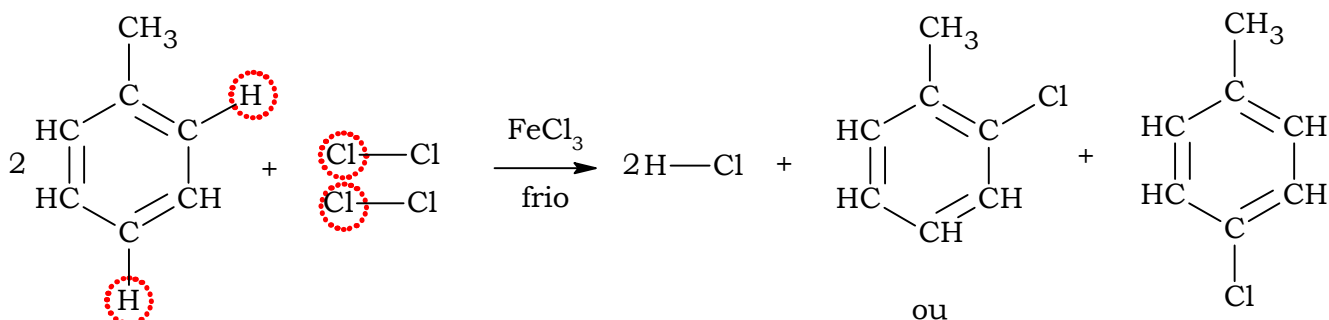
Hidrólise do Composto de Grignard



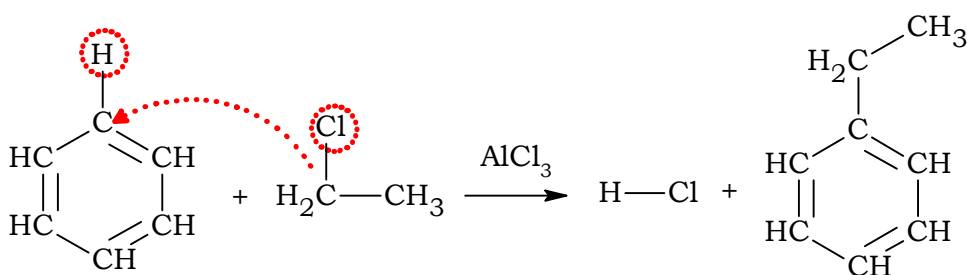
Reação de Composto de Grignard com Haletos



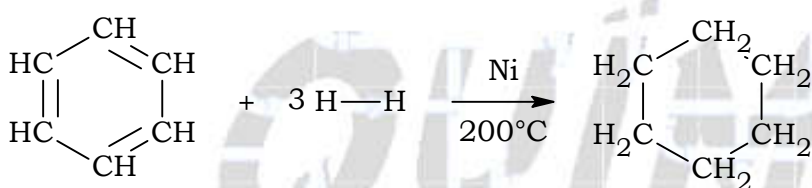
Substituição no anel benzênico



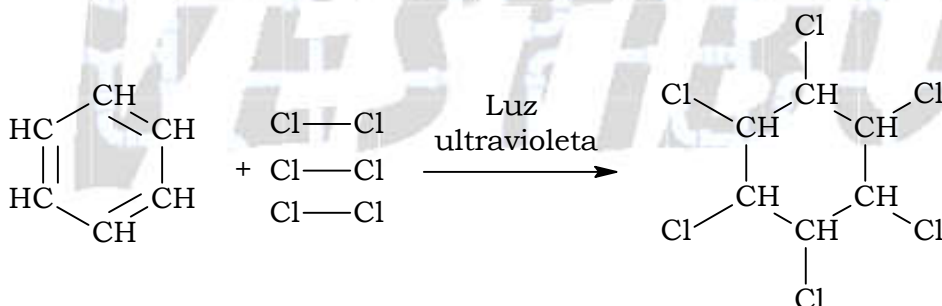
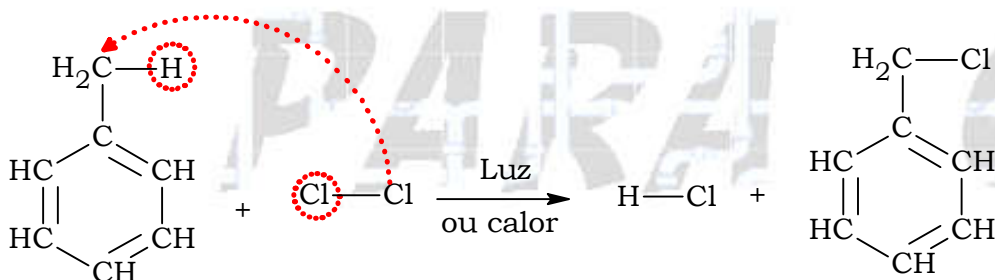
Síntese de Friedel-Crafts



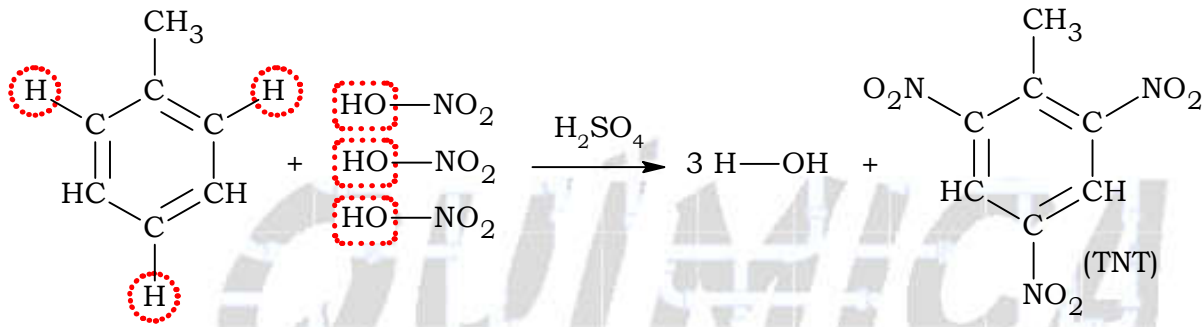
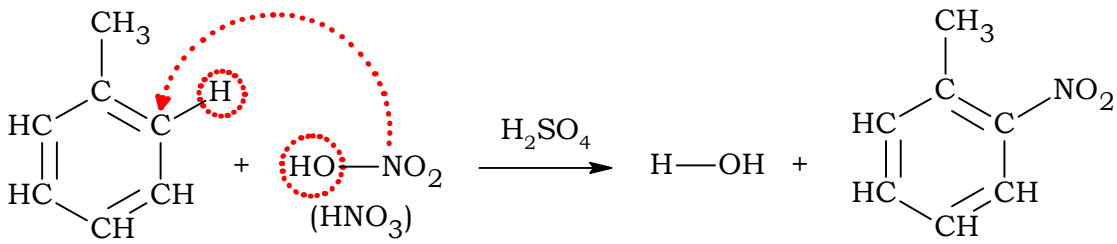
Hidrogenação



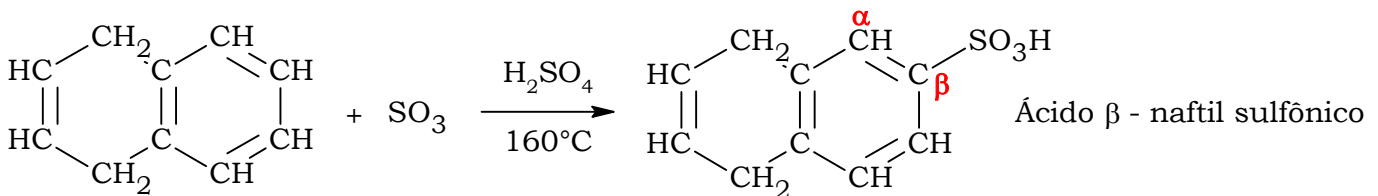
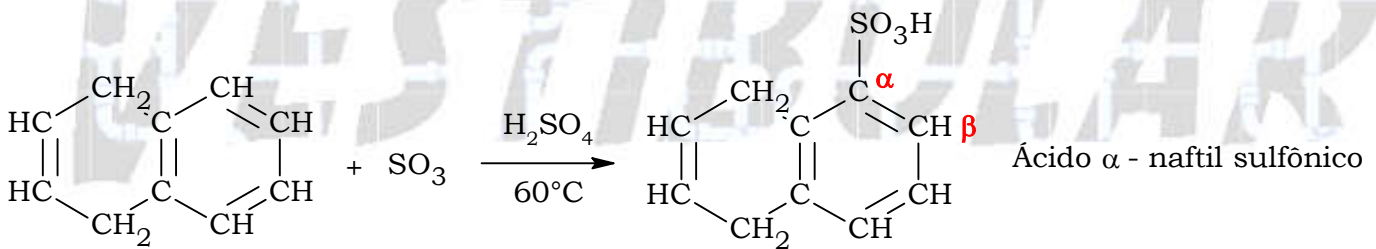
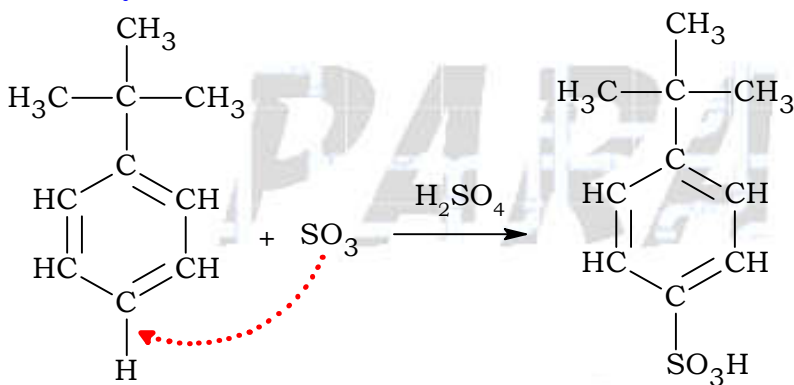
Halogenação



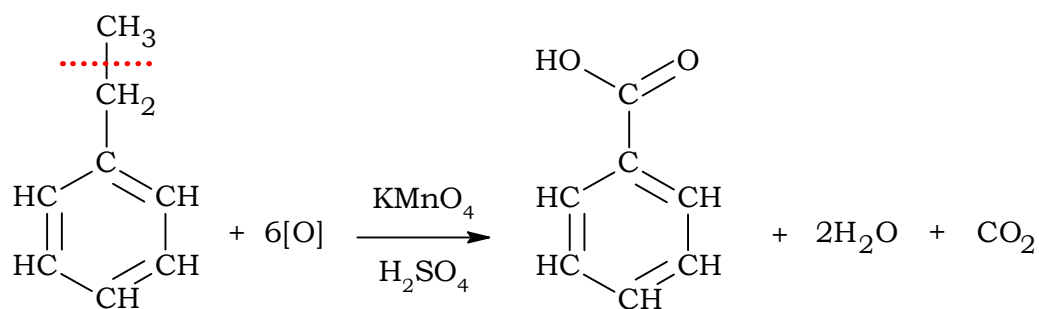
Nitração



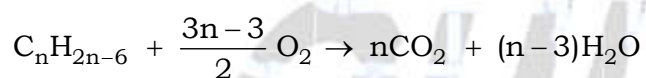
Sulfonação



Oxidação

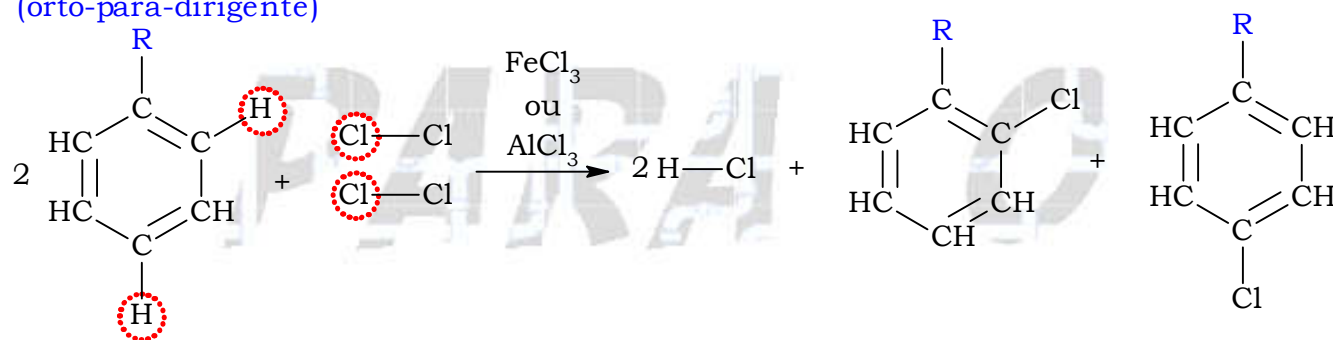


Combustão

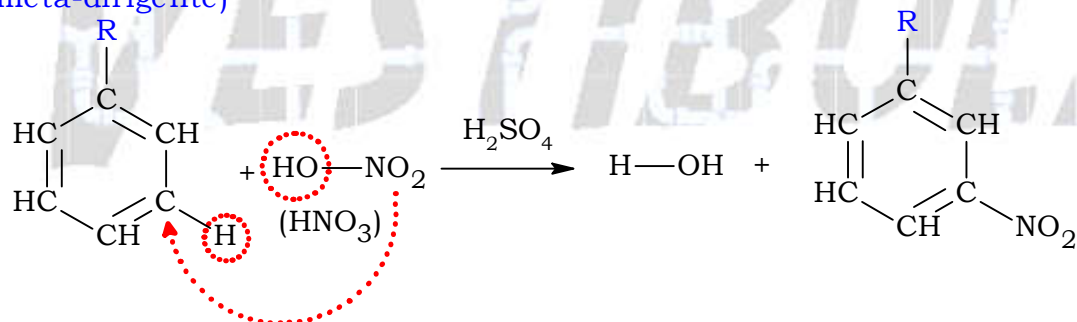


Dirigência dos substituintes ou radicais

(orto-para-dirigente)

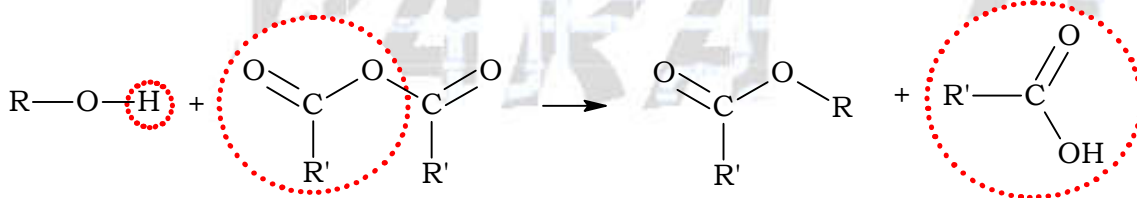
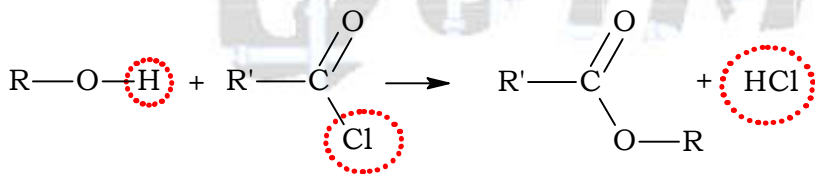
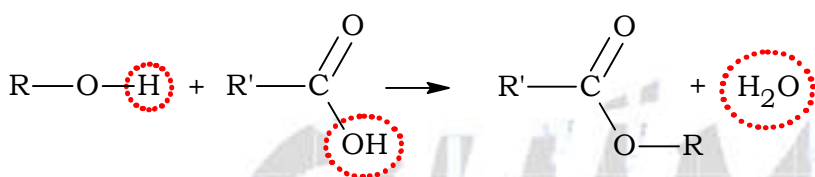
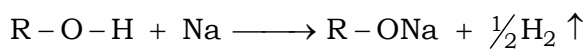


(meta-dirigente)

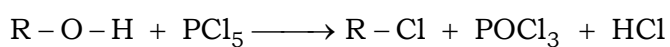
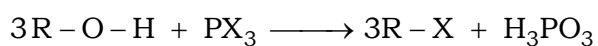
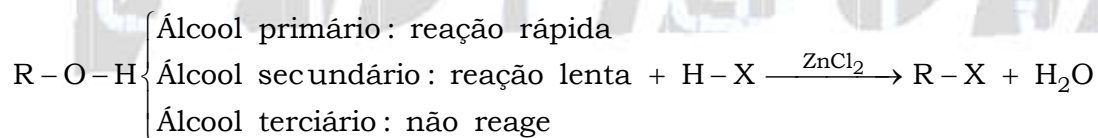


7) Alcoóis

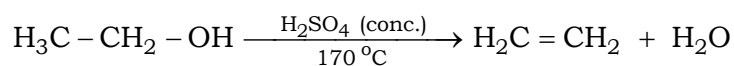
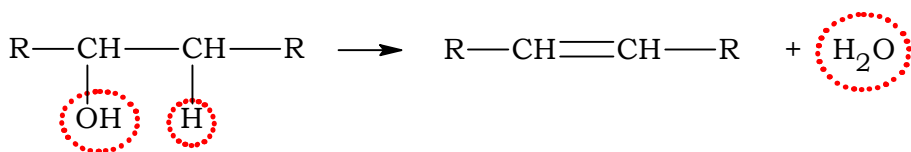
Reações de substituição do "H" do grupo "OH"



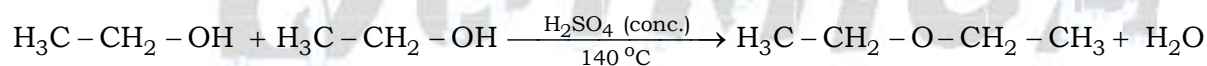
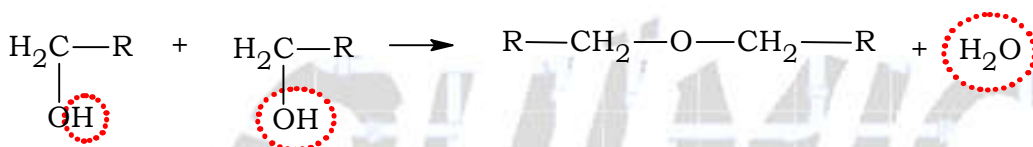
Reações de substituição do grupo "OH"



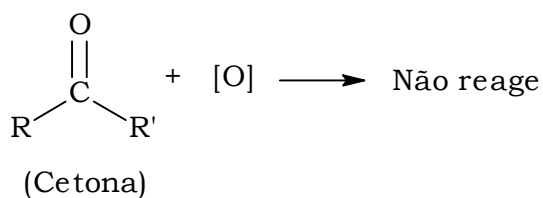
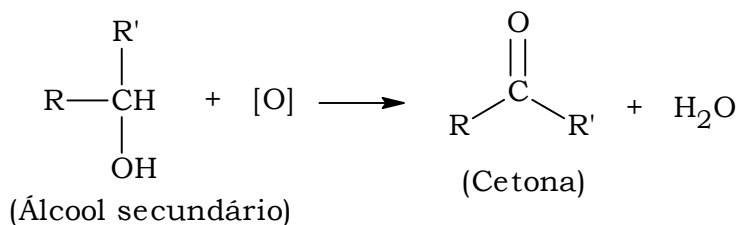
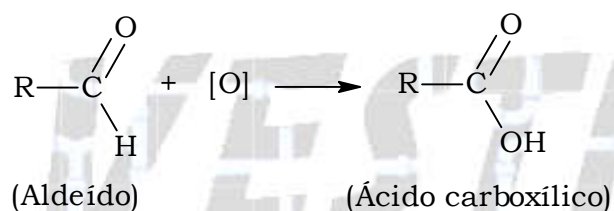
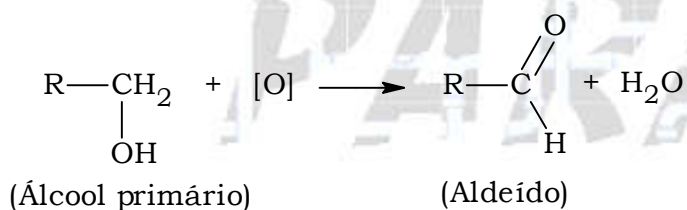
Reações de eliminação intramolecular



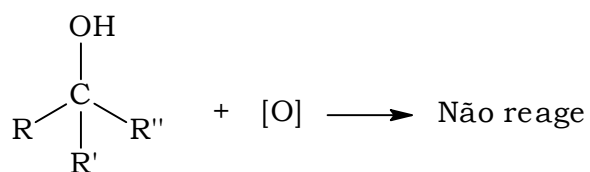
Reações de eliminação intermolecular



Reações de oxidação

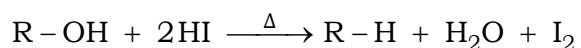


Reações de oxidação

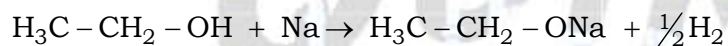


(Álcool terciário)

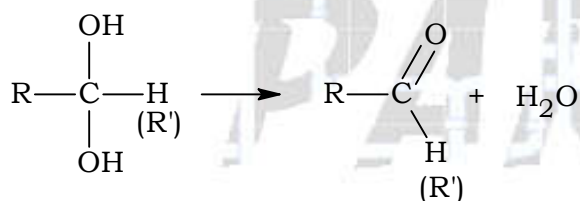
Reação de redução (Reação de Berthelot)



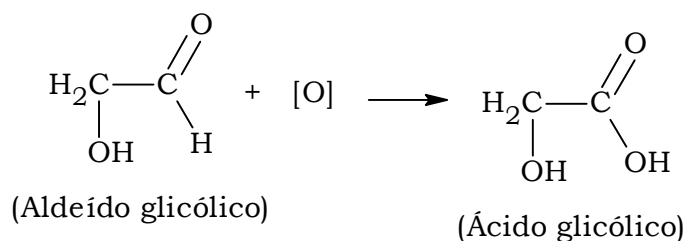
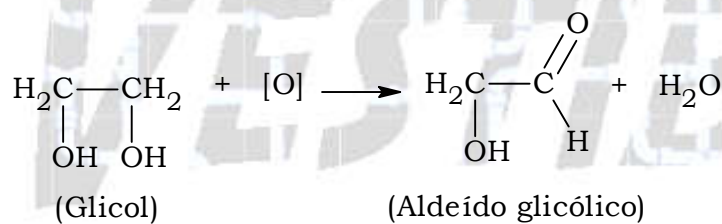
Reação com sódio metálico (Na)



Decomposição espontânea de glicóis em aldeídos e/ou cetonas

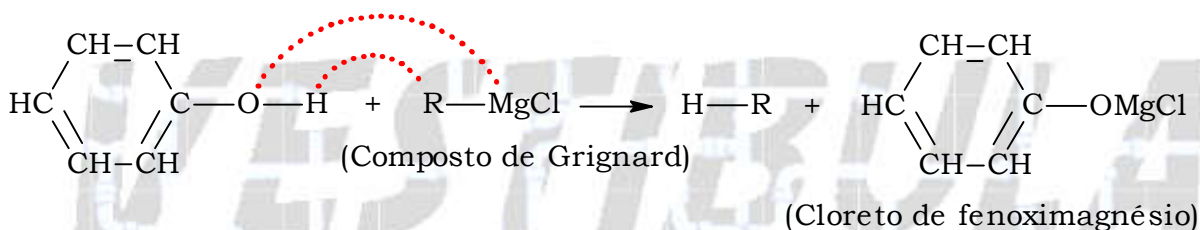
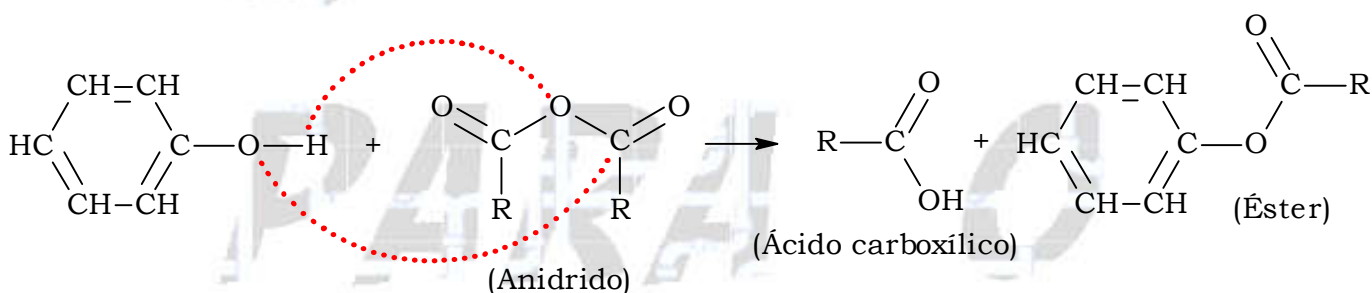
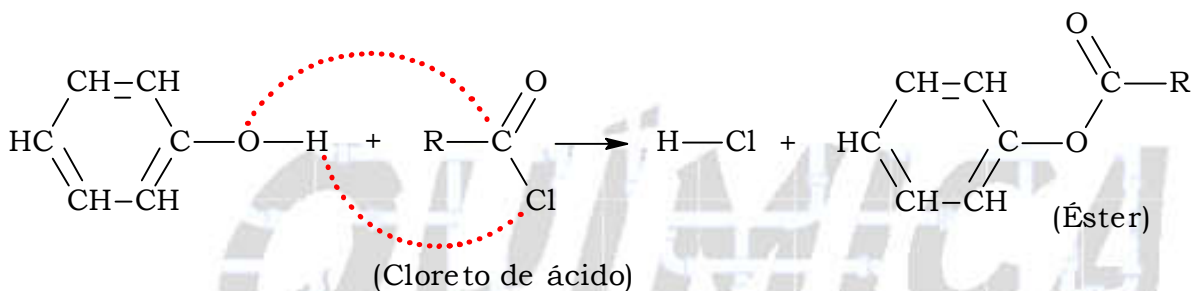
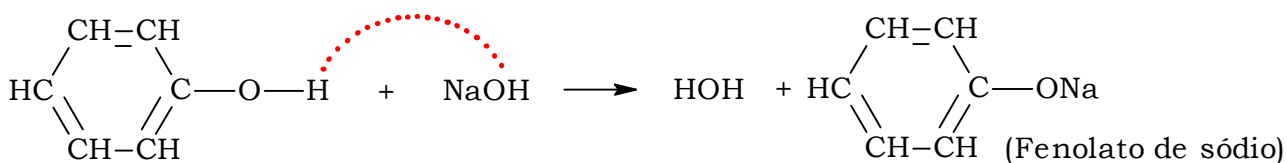


Oxidação do Glicol

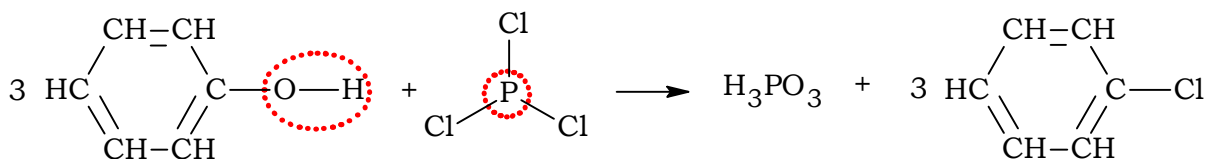


8) Fenóis

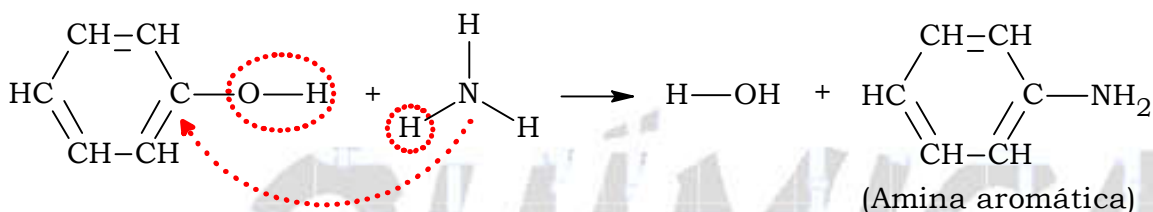
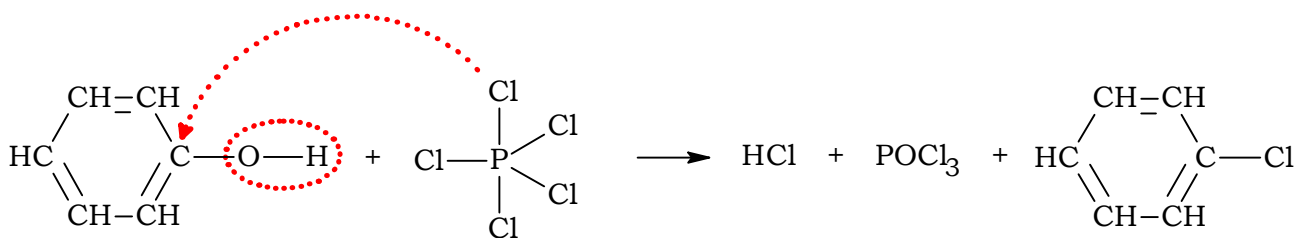
Substituição do "H" do grupo "OH"



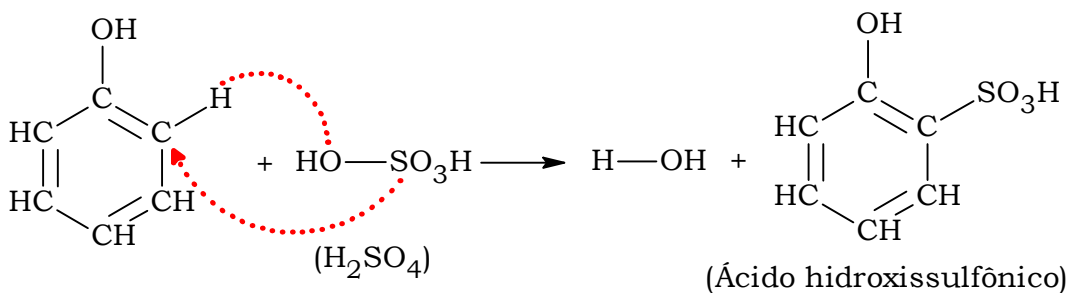
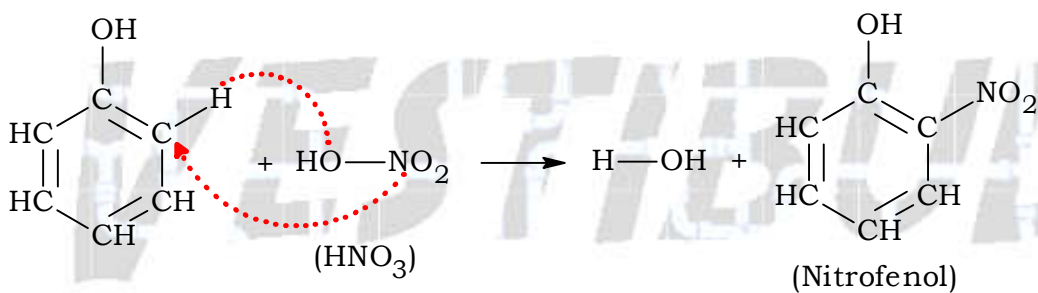
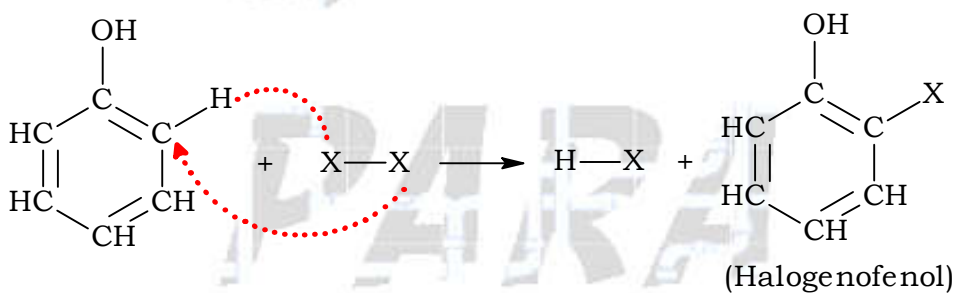
Substituições do grupo OH



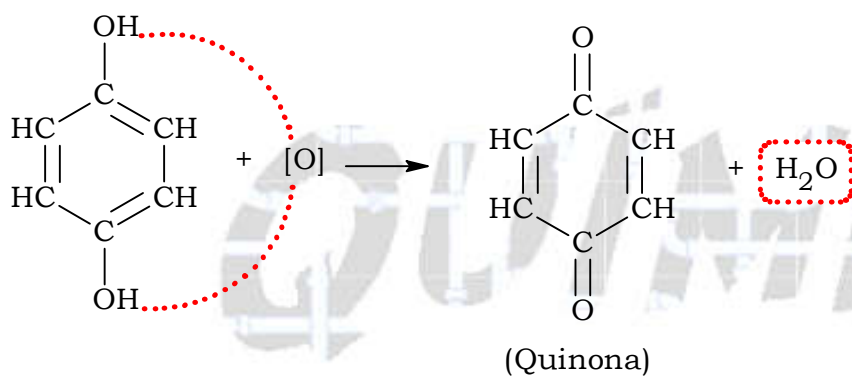
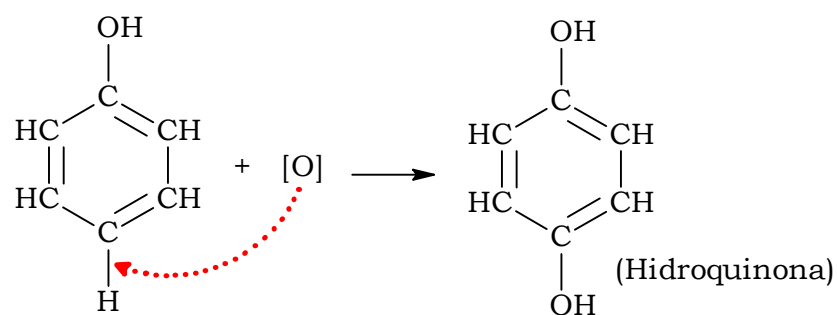
Substituições do grupo OH



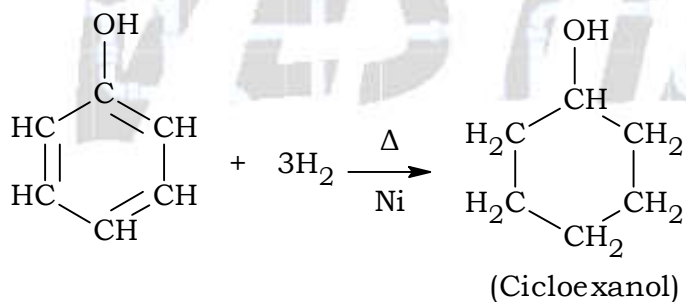
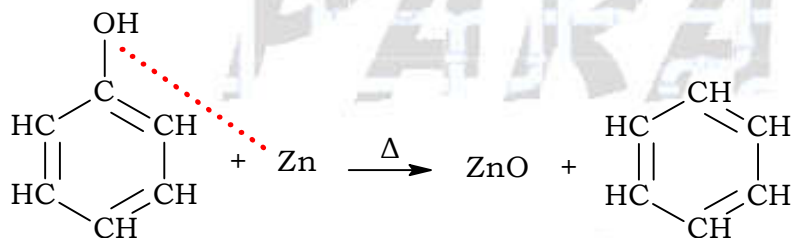
Substituições do "H" do anel benzênico



Reações de oxidação

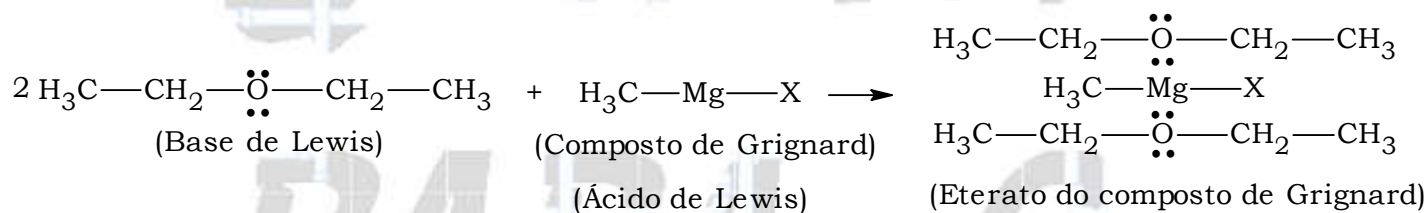
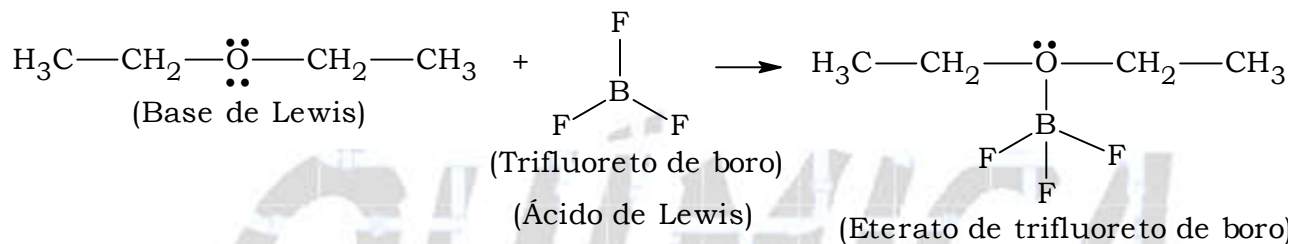
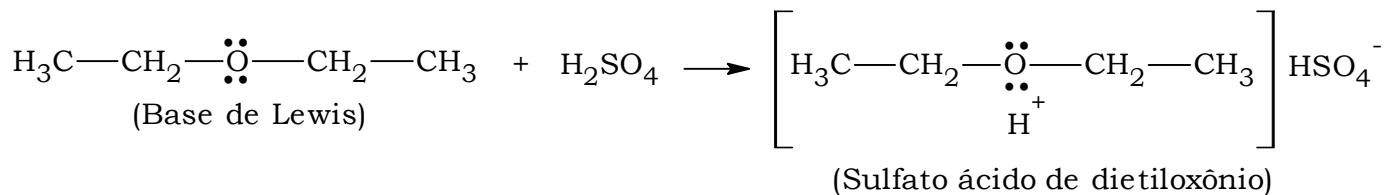


Reações de redução

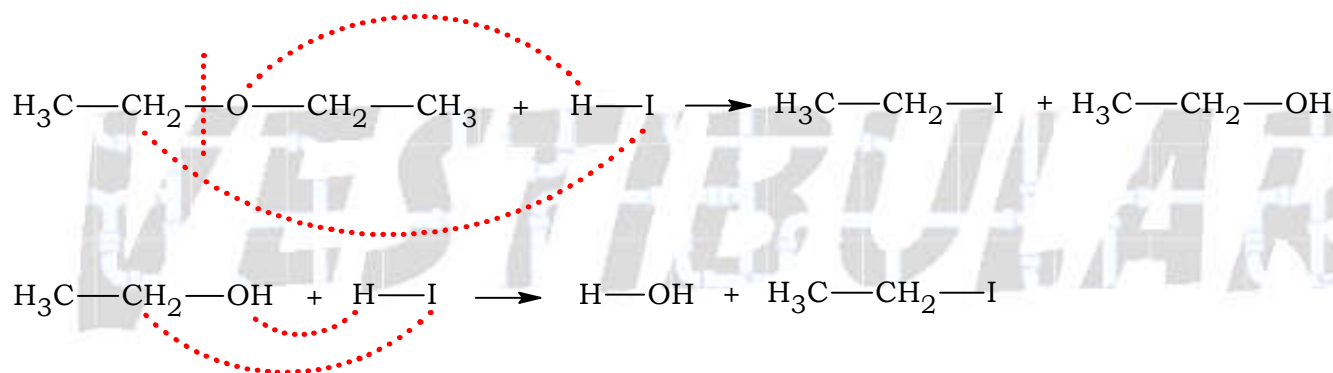


9) Éteres

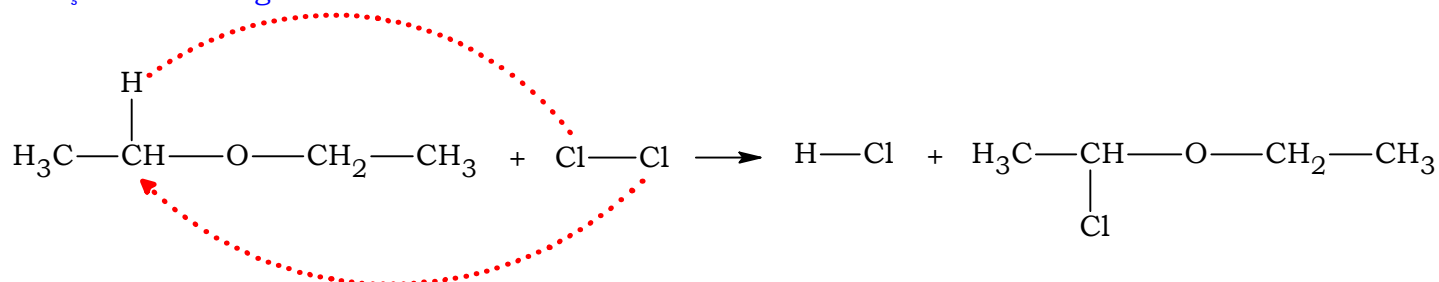
Caráter básico



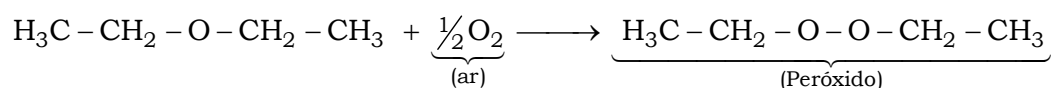
Cisão por ácidos



Reação com halogênio

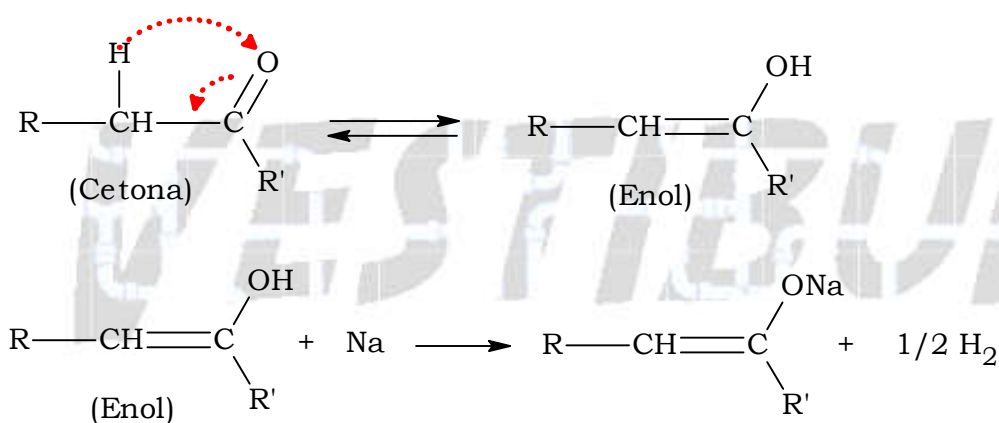
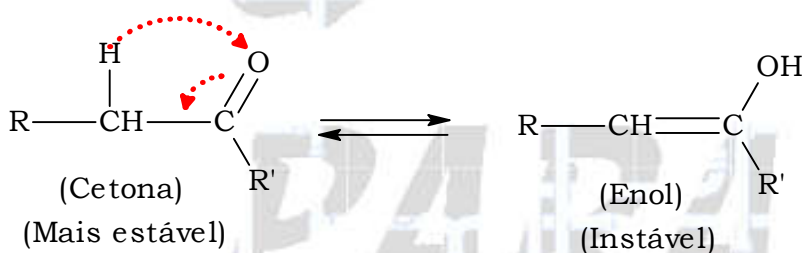
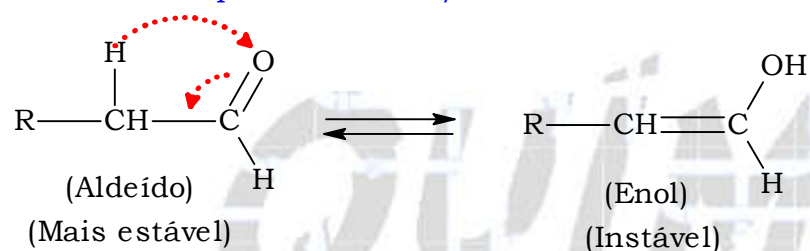


Oxidação

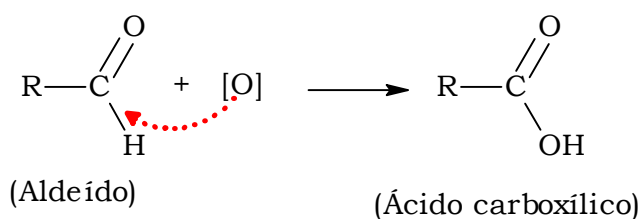


10) Aldeídos e Cetonas

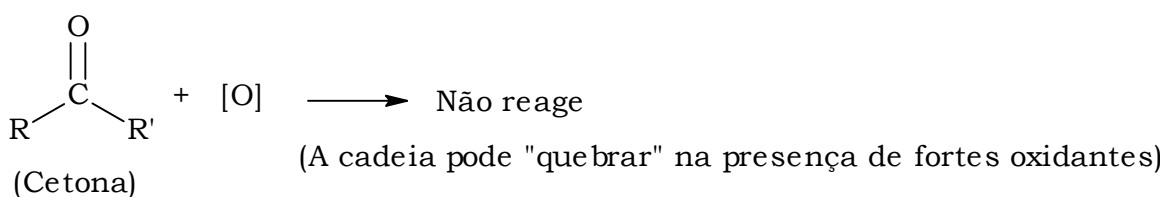
Tautomeria: equilíbrio Aldeído/Cetona e Enol



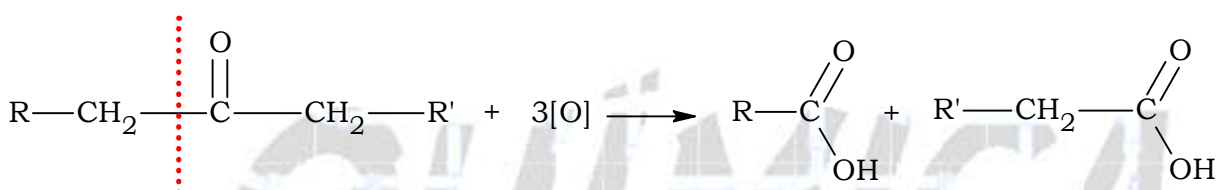
Oxidação de Aldeído



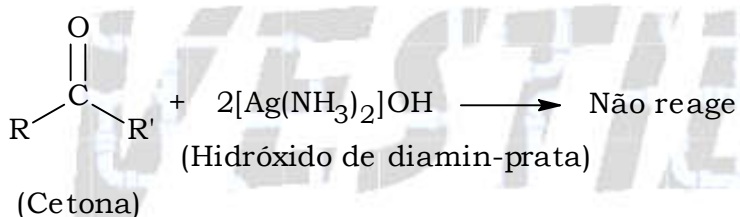
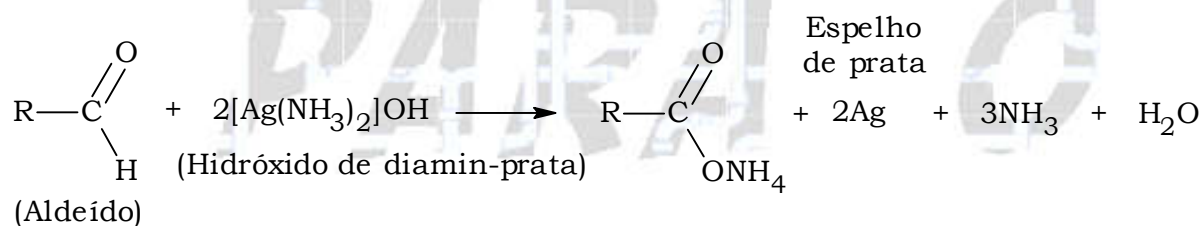
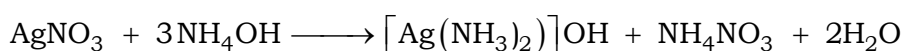
Oxidação de Cetona



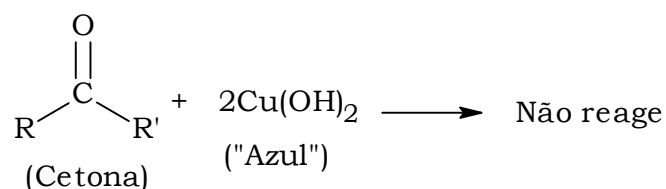
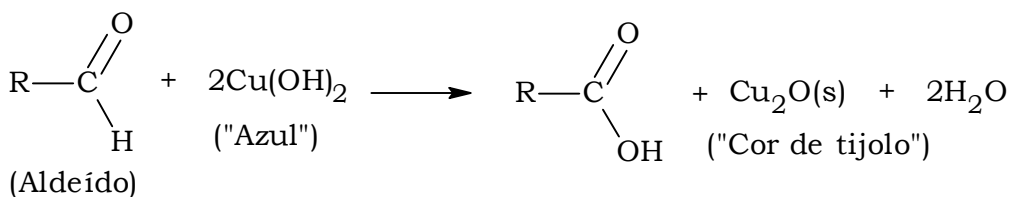
Cetonas podem ser oxidadas na presença de fortes oxidantes enérgicos (KMnO_4 , $\text{K}_2\text{Cr}_2\text{O}_7$, etc.) em condições especiais ("à força"). Neste caso ocorre a ruptura da cadeia:



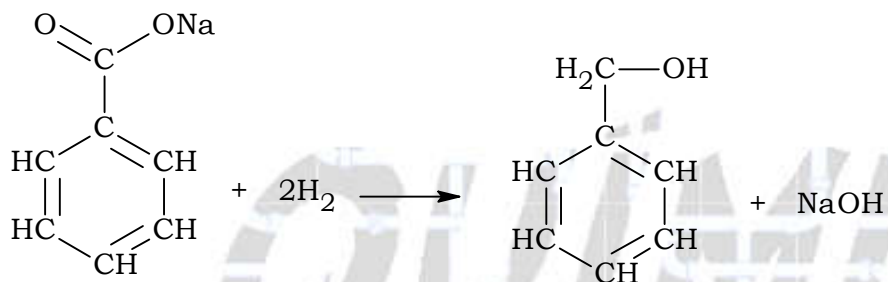
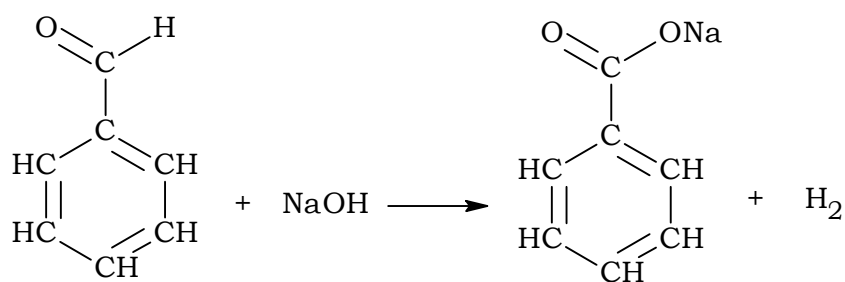
Reativo de Tollens:



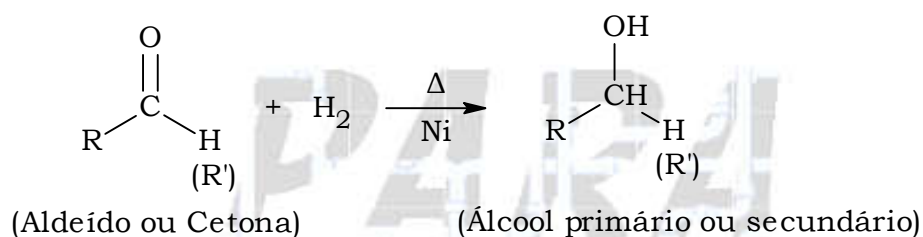
Reativo de Fehling (ou licor de Fehling):



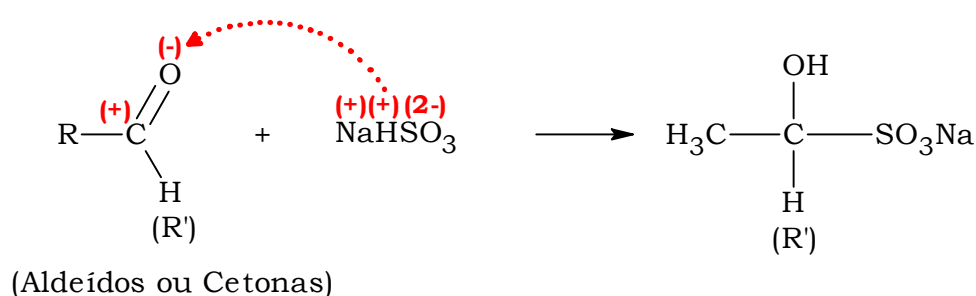
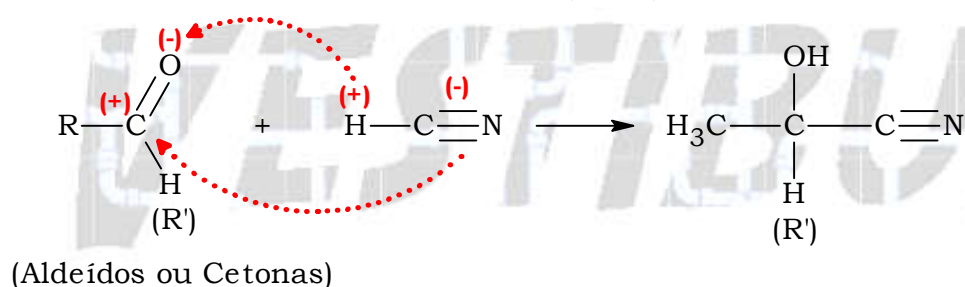
Auto-oxirredução do benzaldeído



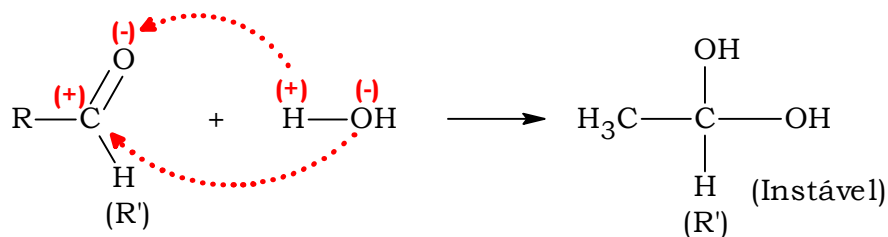
Reações de redução



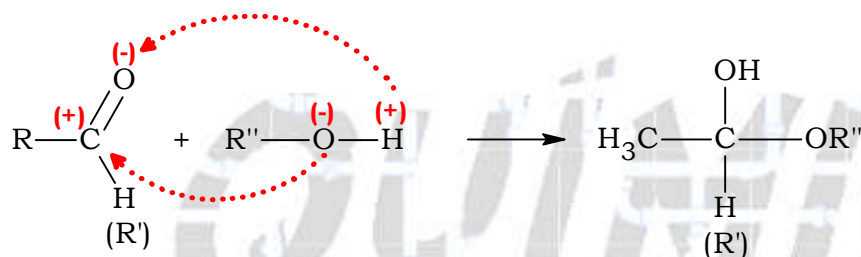
Reações de adição ao grupo carbonila (C = O)



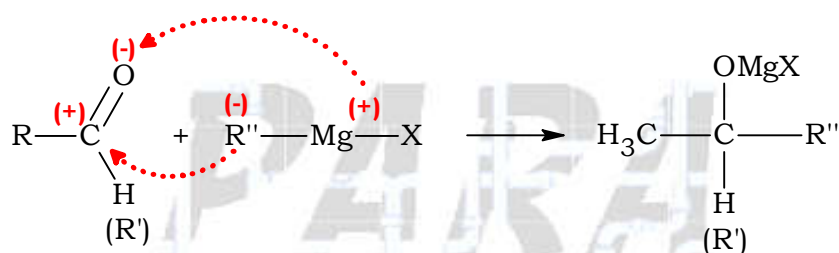
Reações de adição ao grupo carbonila (C = O)



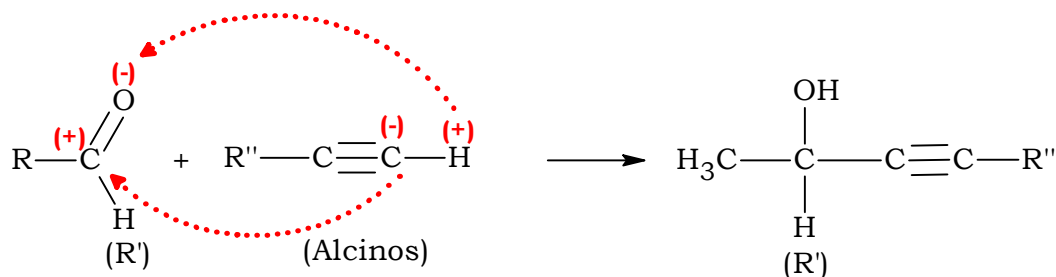
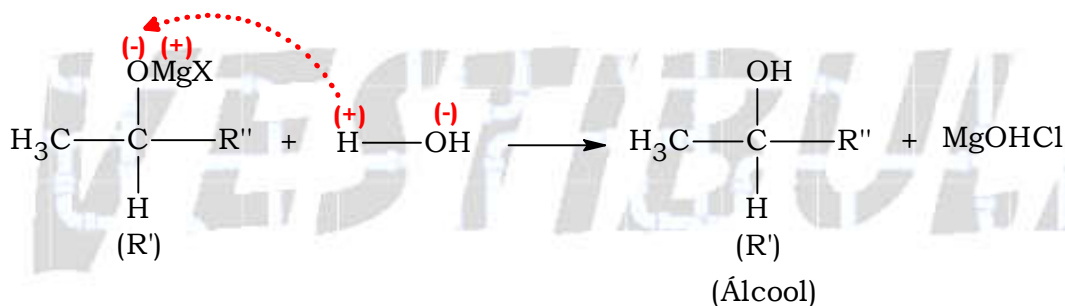
(Aldeídos ou Cetonas)



(Aldeídos ou Cetonas)



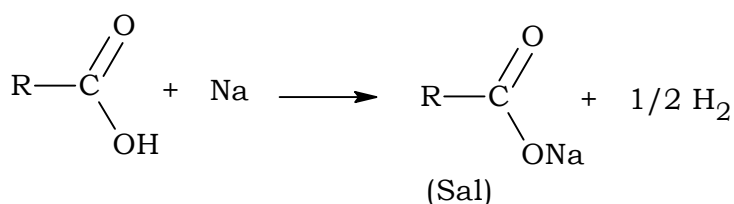
(Aldeídos ou Cetonas)



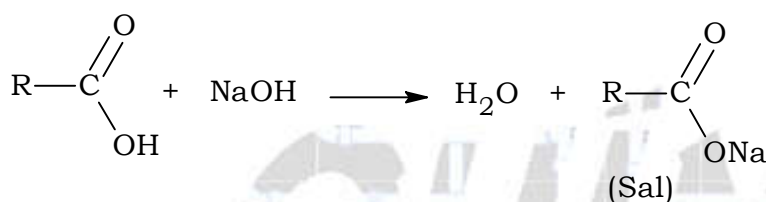
(Aldeídos ou Cetonas)

(Alcoóis acetilênicos)

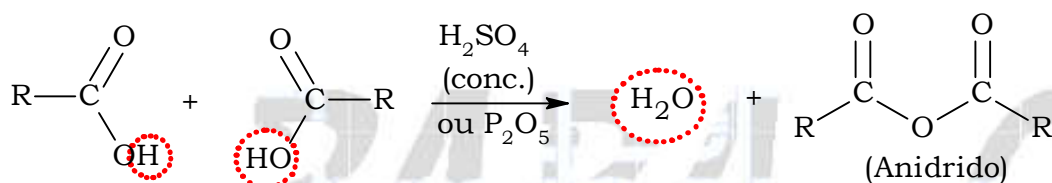
Reação com metal



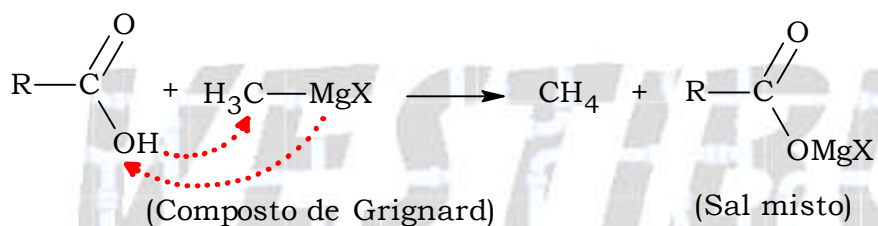
Reação com base



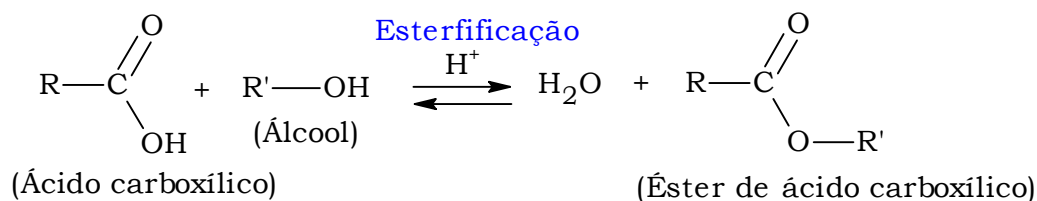
Desidratação (formação de Anidrido)



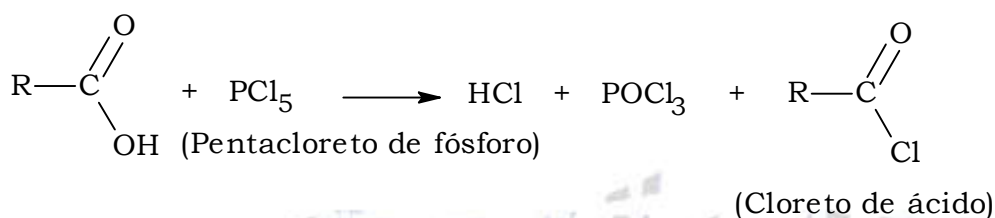
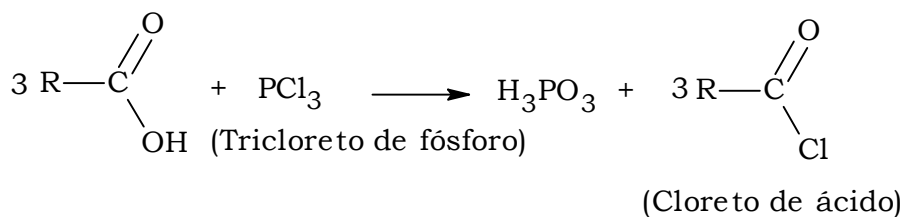
Reação com Composto de Grignard (Reação de Zerewitinoff)



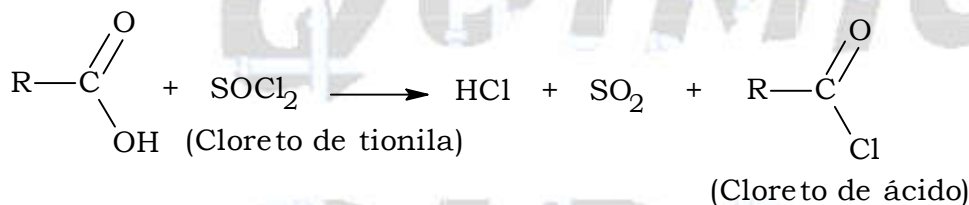
Reação de esterificação



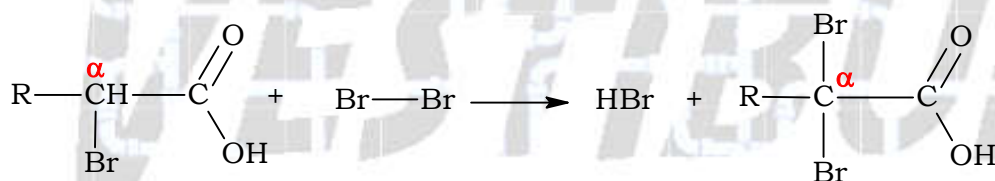
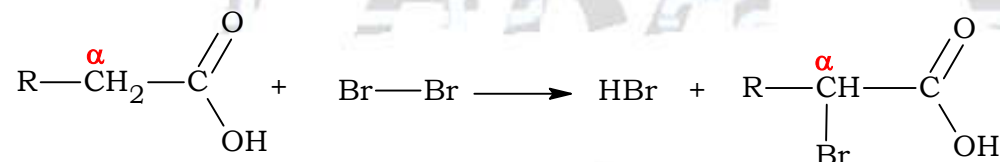
Reações com haletos de fósforo



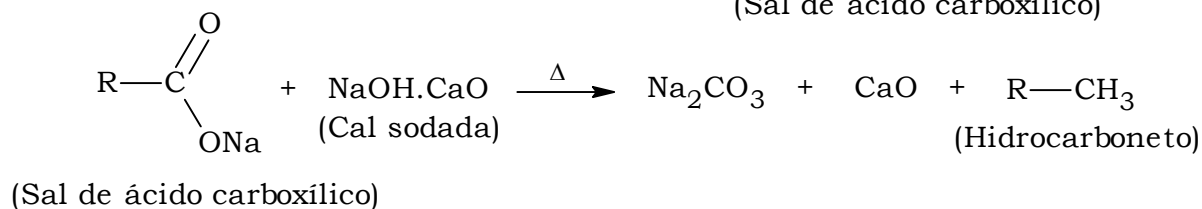
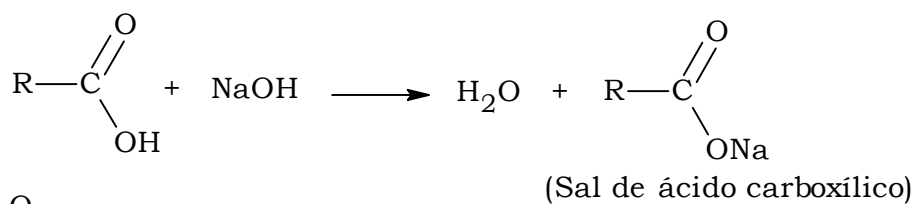
Reação com cloreto de tionila



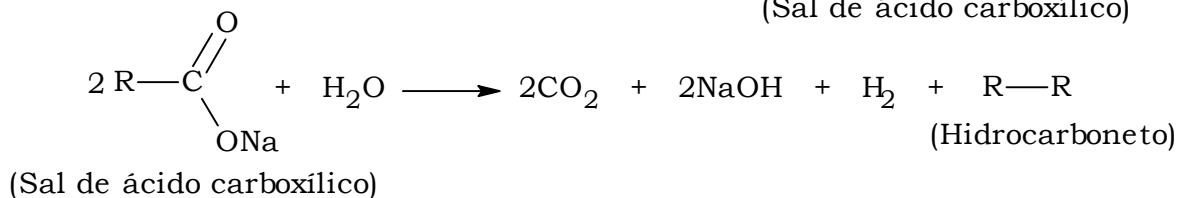
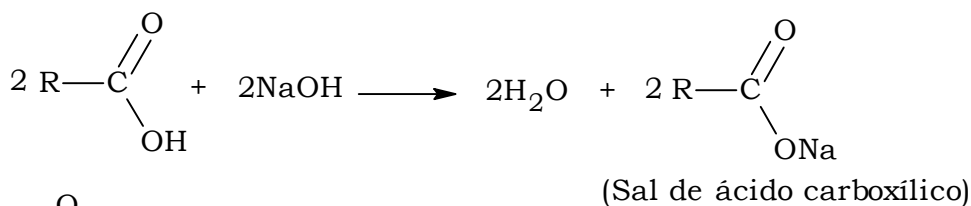
Reações de halogenação no carbono alfa (α)



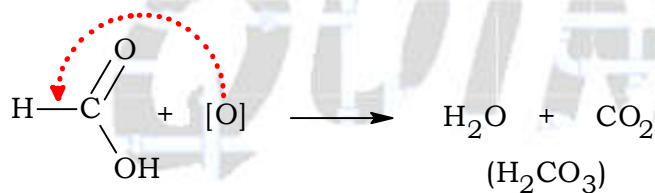
Método de Dumas ou fusão alcalina



Método de Kolbe (eletrolítico)

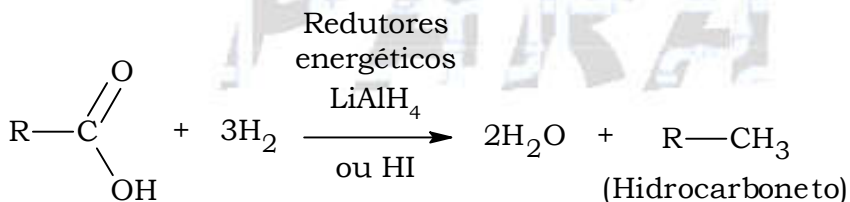


Oxidação do ácido fórmico ou metanoico



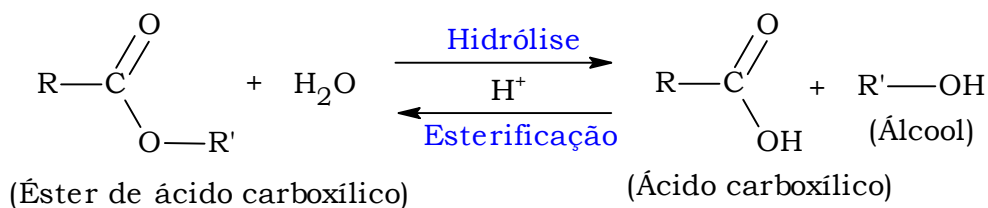
(Ácido fórmico ou metanoico)

Redução

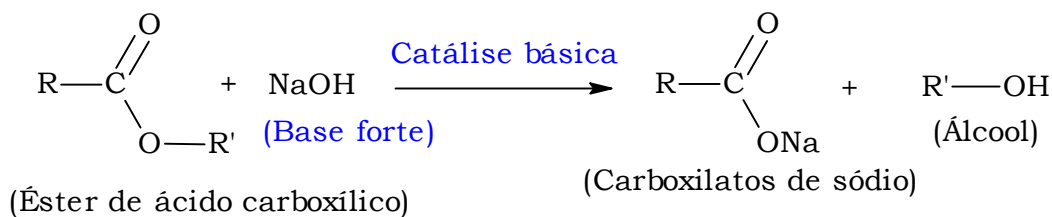


12) Ésteres

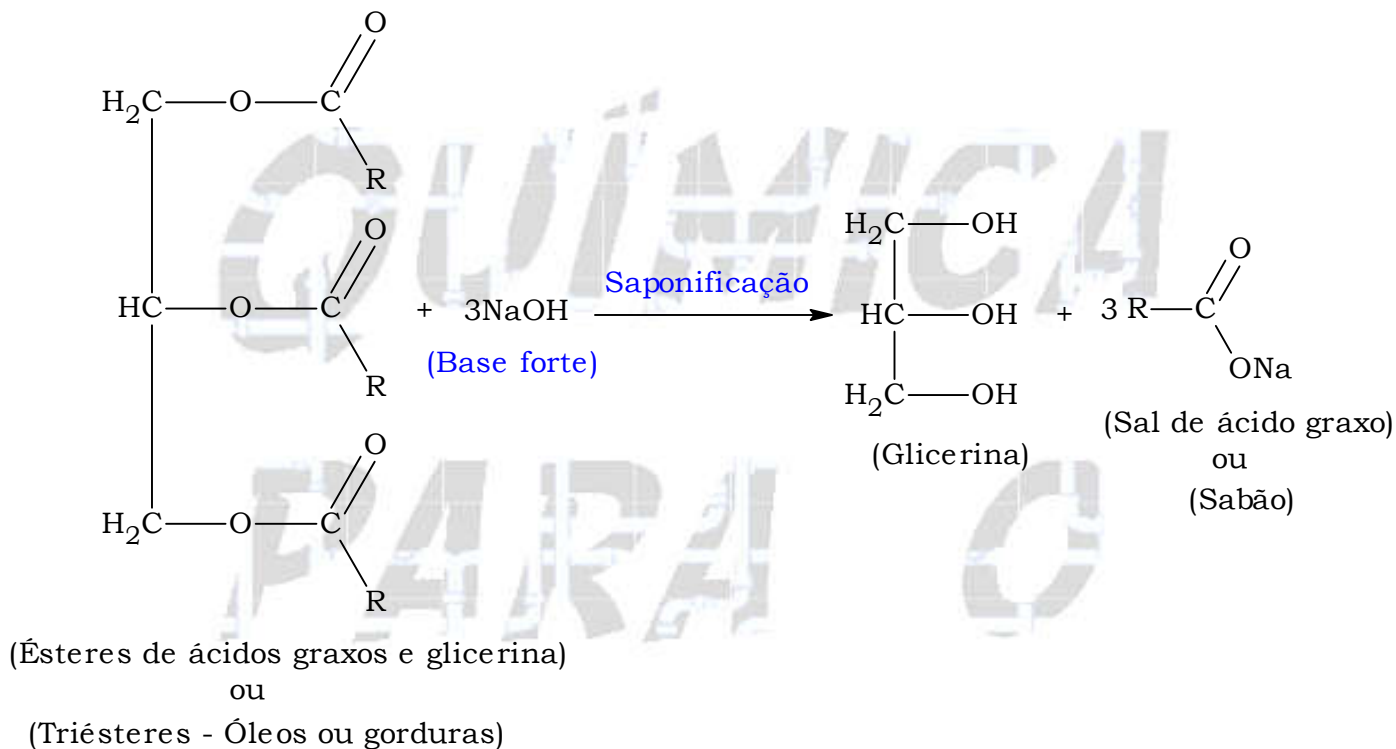
Reações de Hidrólise e Esterificação (equilíbrio)



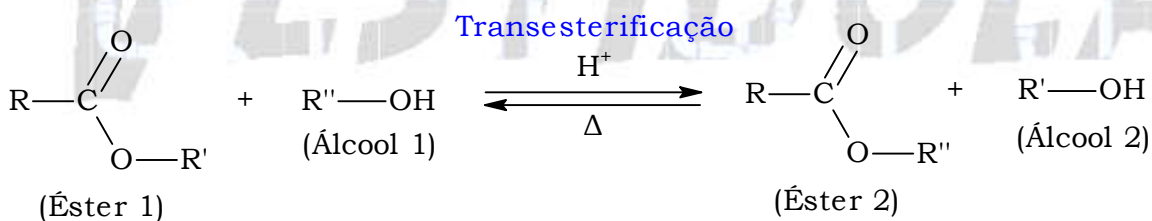
Reação com base forte



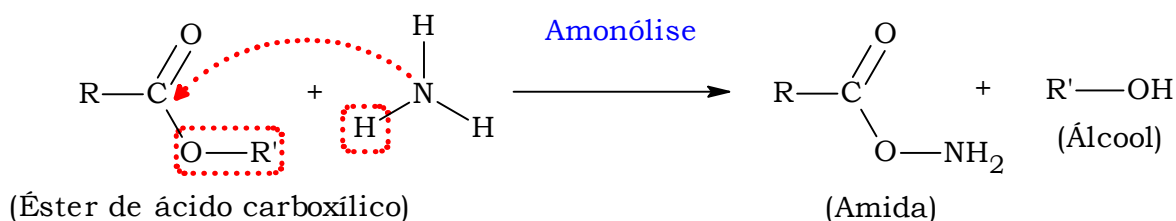
Reação de Saponificação



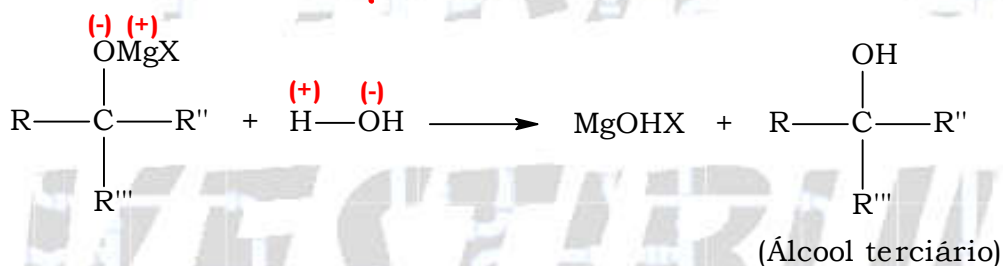
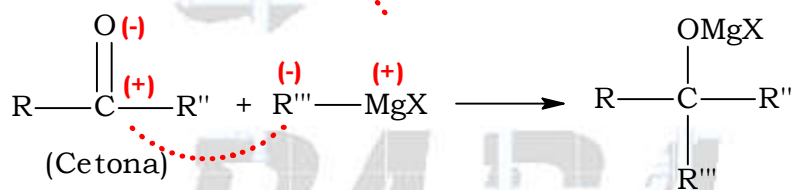
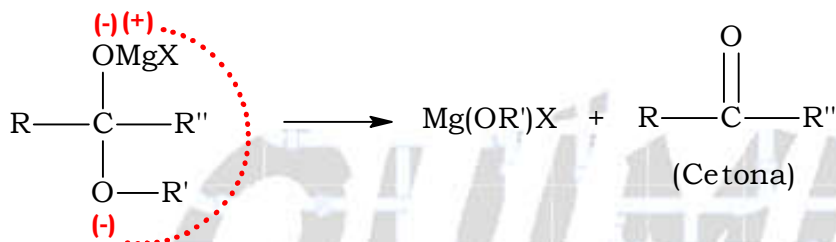
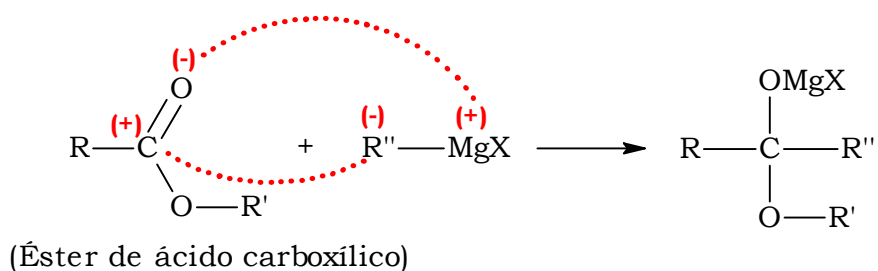
Reação de Transesterificação ou Alcoólise



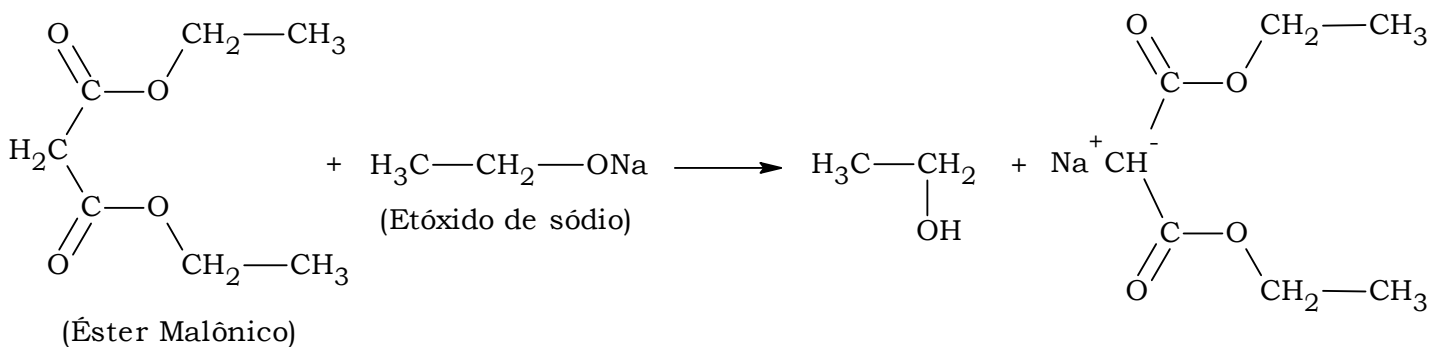
Reação de Amonólise



Reação com Composto de Grignard

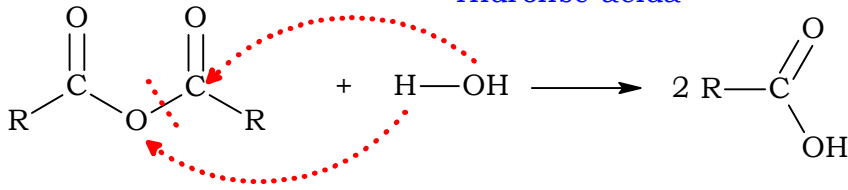


Reação do Êster Malônico com Etóxido de sódio

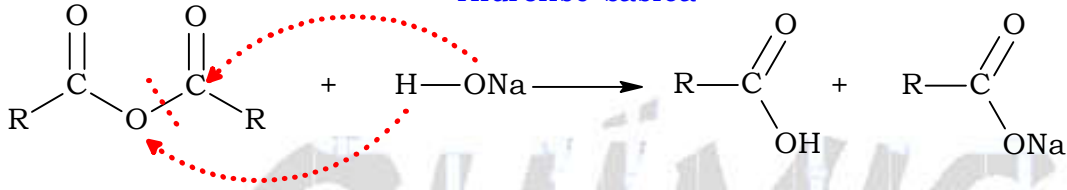


13) Anidridos

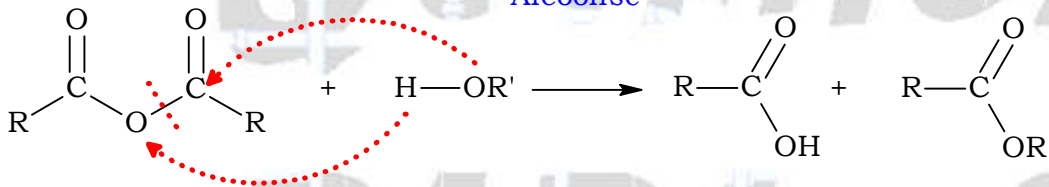
Hidrólise ácida



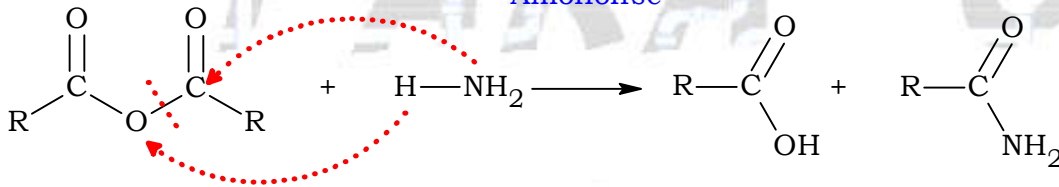
Hidrólise básica



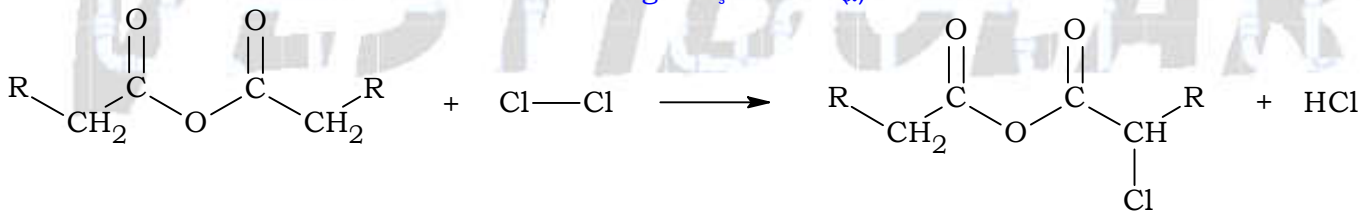
Alcoólise



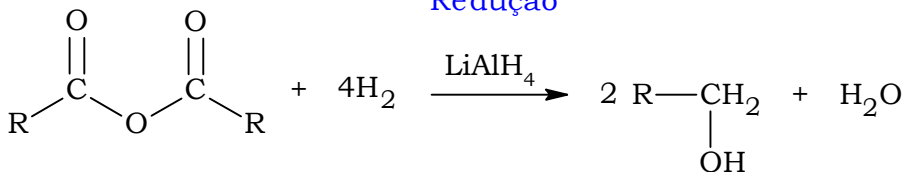
Amonólise

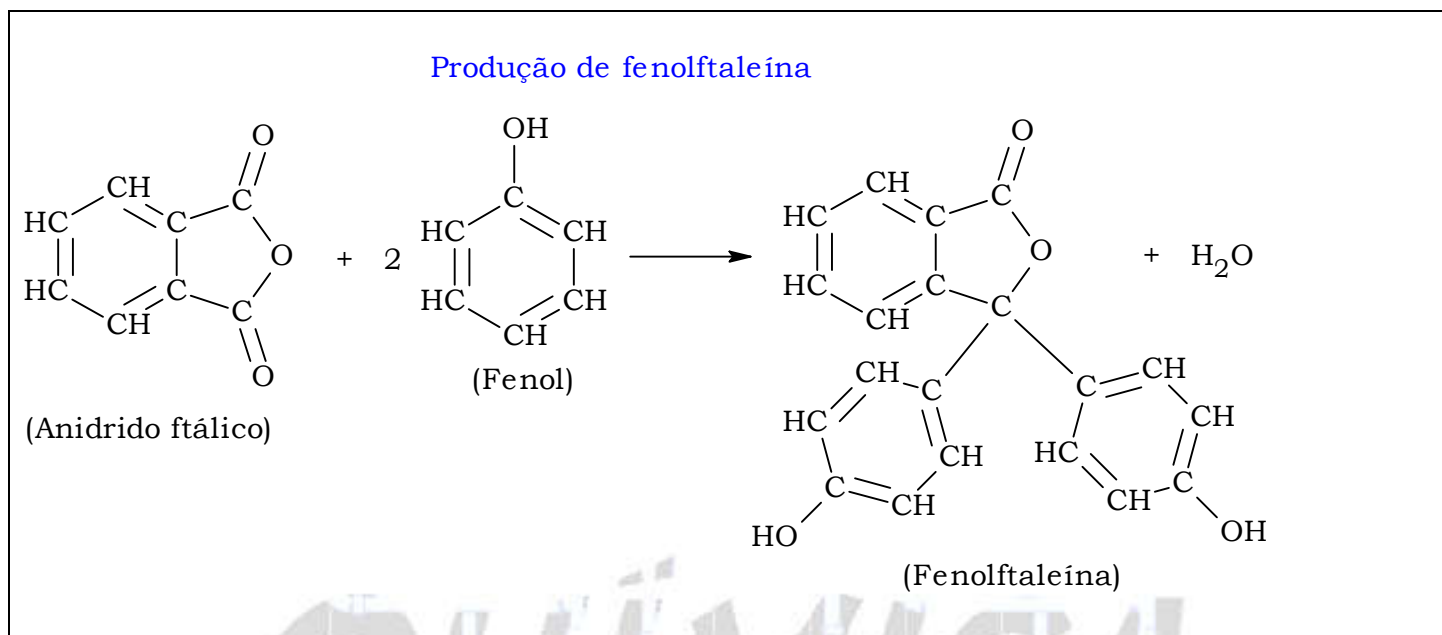


Halogenação alfa (α)

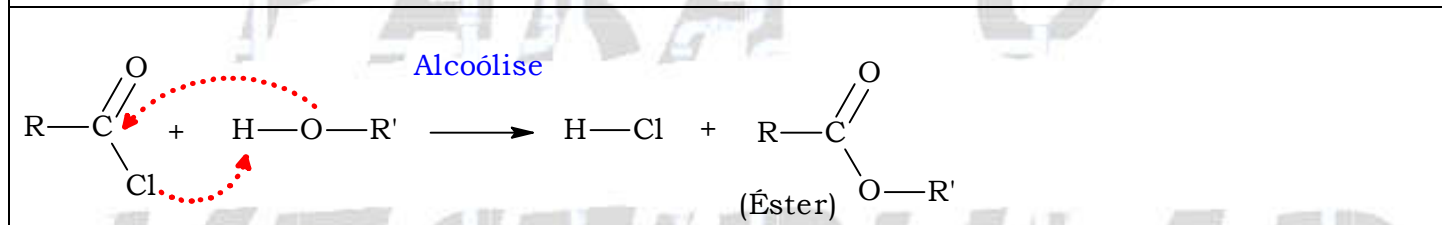
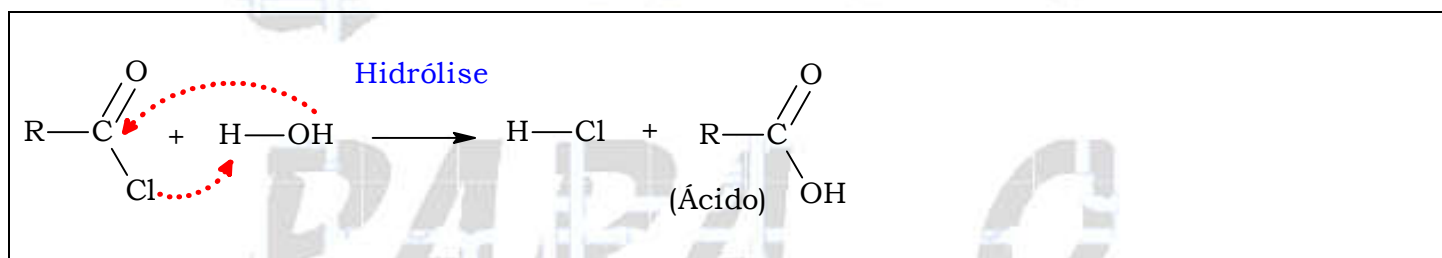


Redução

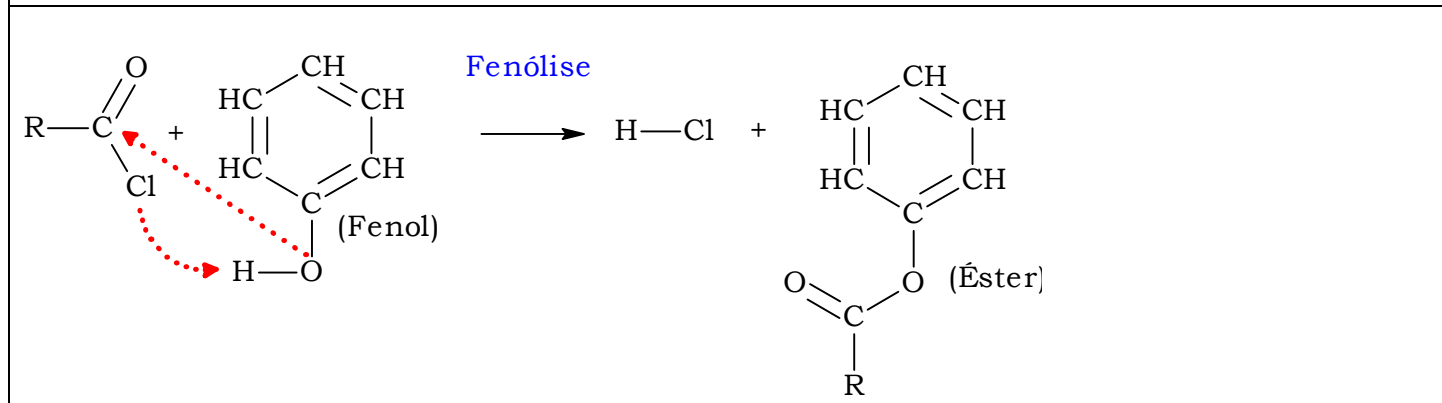
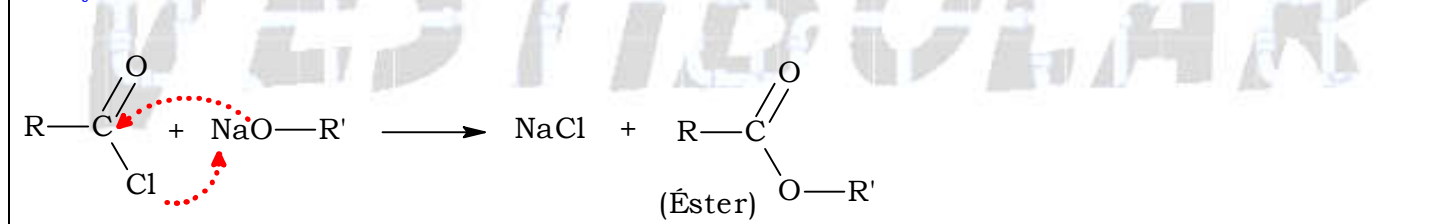




14) Cloreto de ácidos

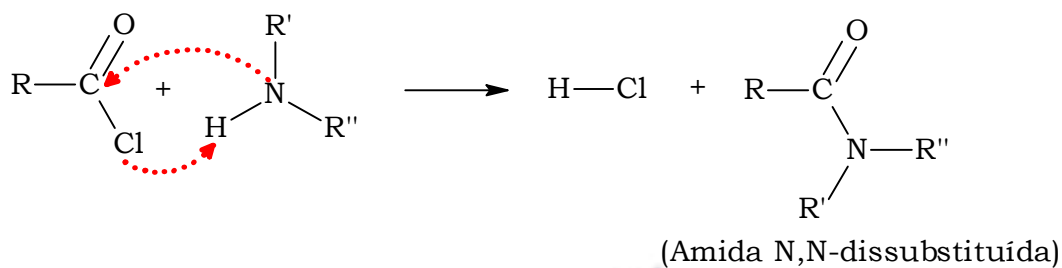
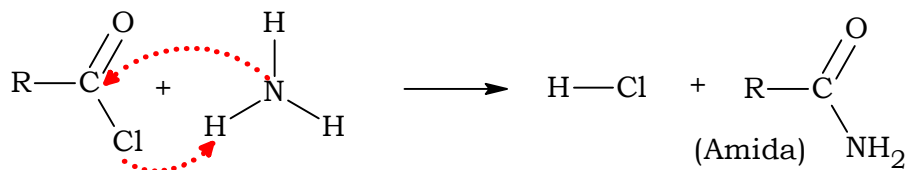


Reação com alcoóxidos

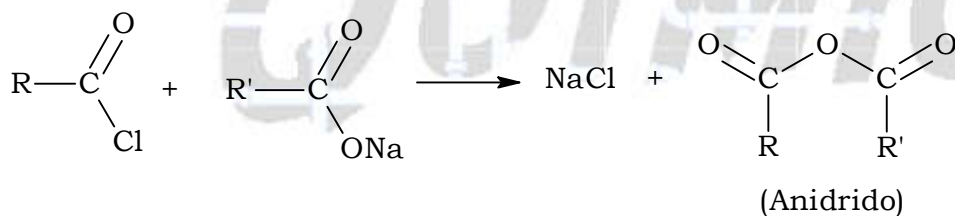


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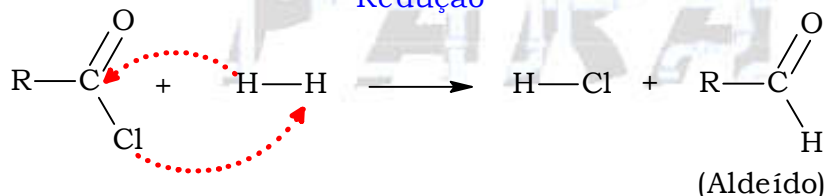
Amonólise



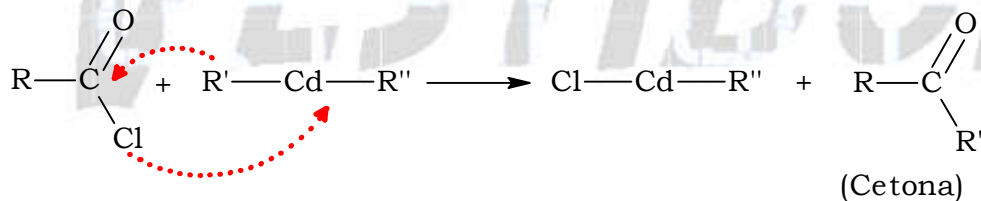
Reação com sal



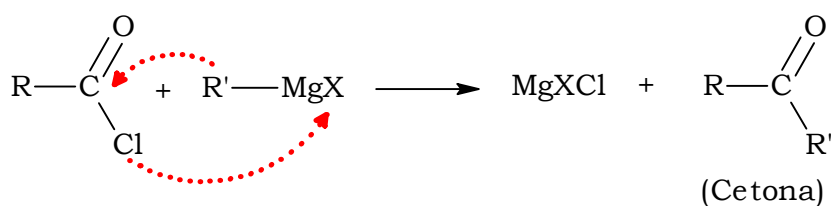
Redução



Reações com organometálicos do Cádmio

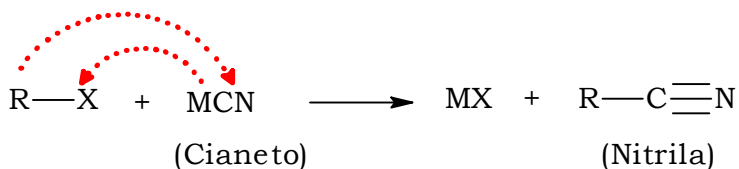
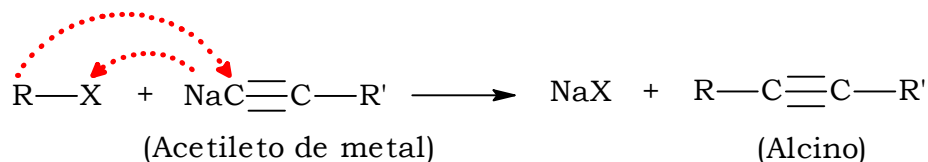
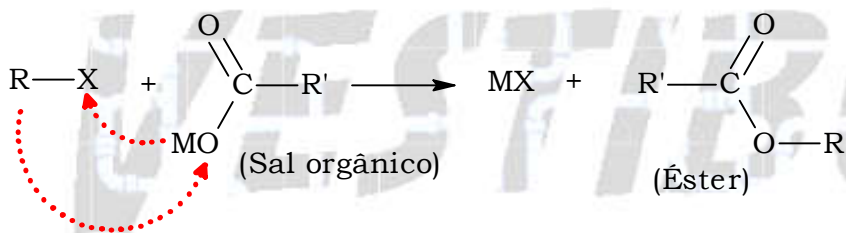
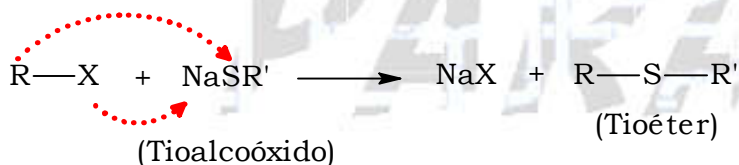
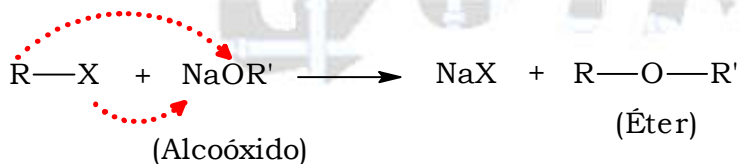
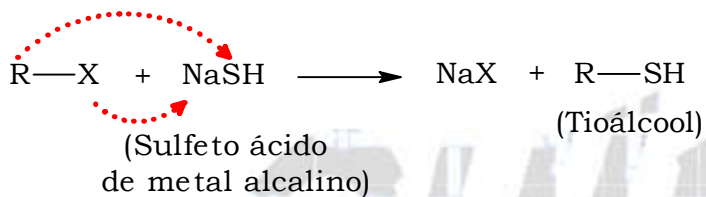
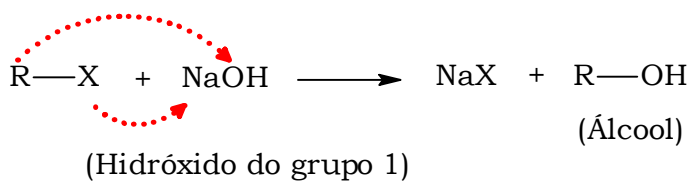


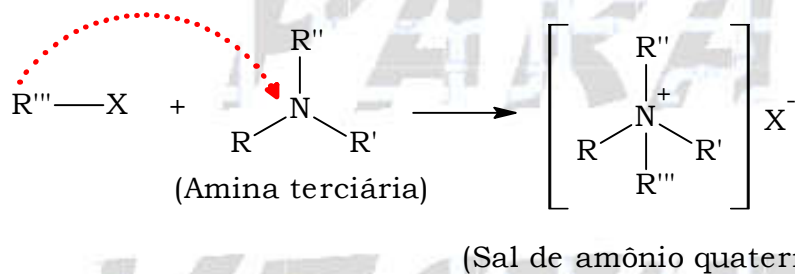
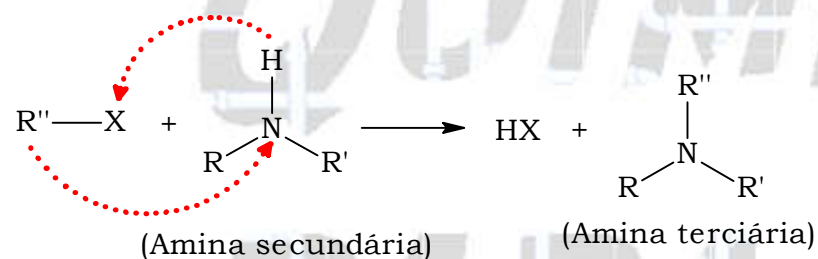
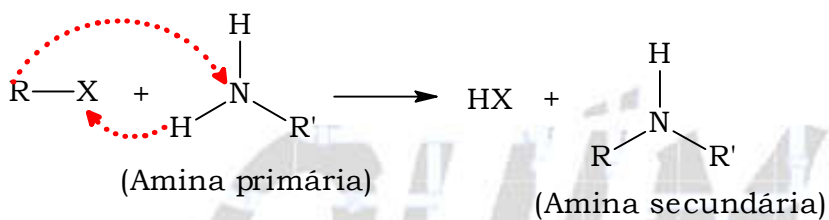
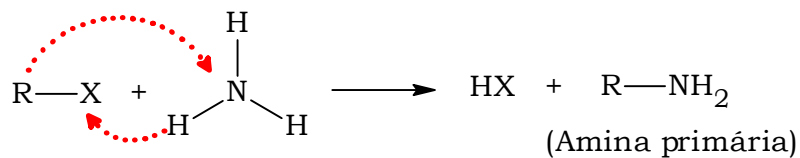
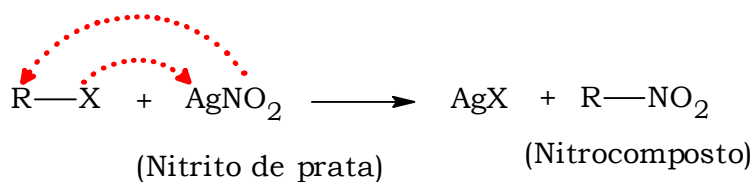
Reações com Compostos de Grignard



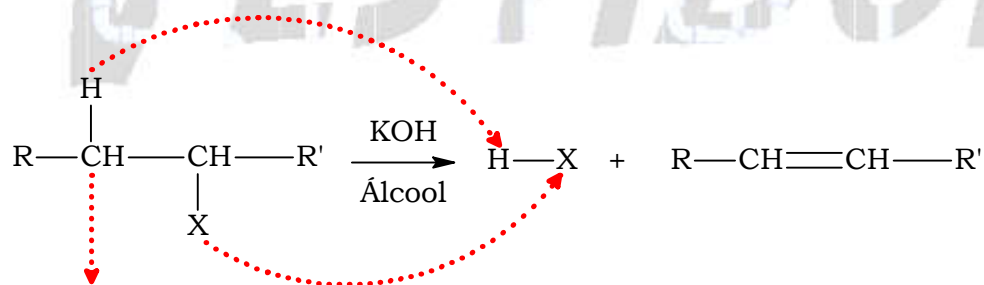
15) Compostos halogenados

Reações de substituição



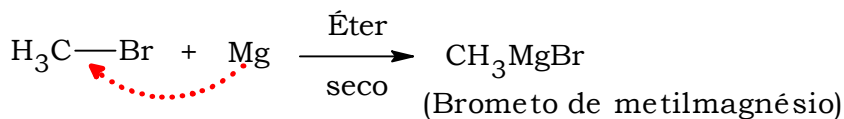


Reações de eliminação

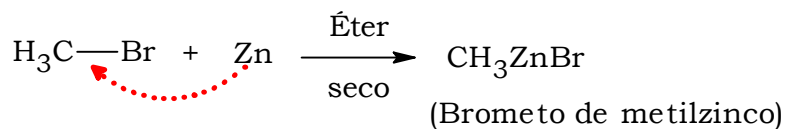


O "H" sai do Carbono menos hidrogenado (Regra de Saytzeff)

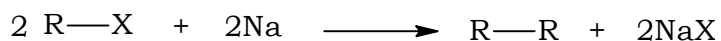
Adição de metal



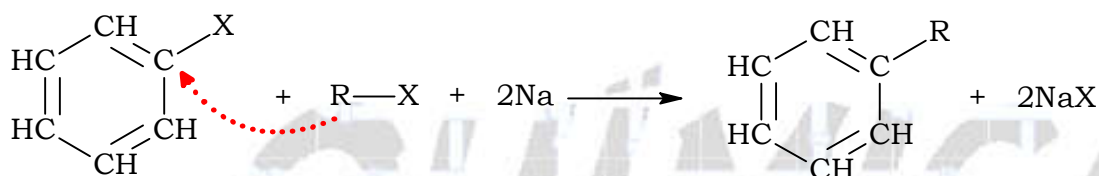
Adição de metal



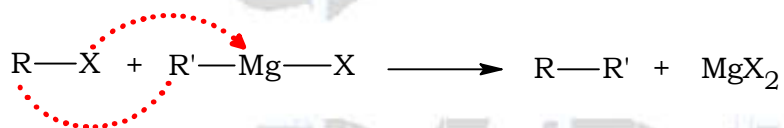
Síntese de Wurtz



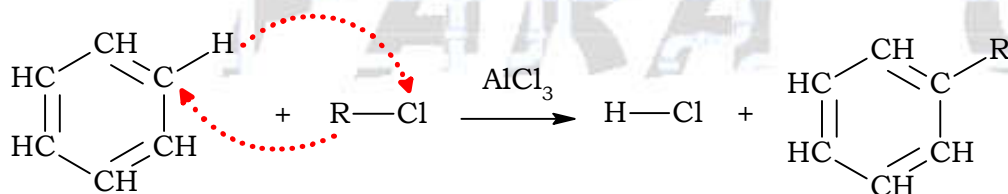
Síntese de Wurtz - Fittg



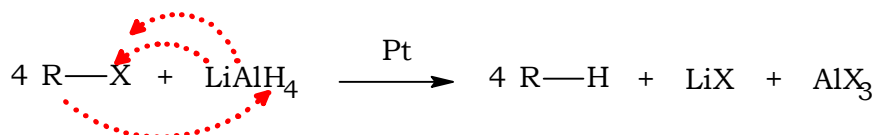
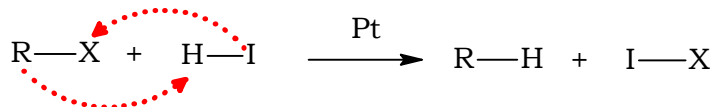
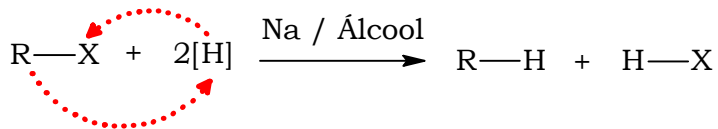
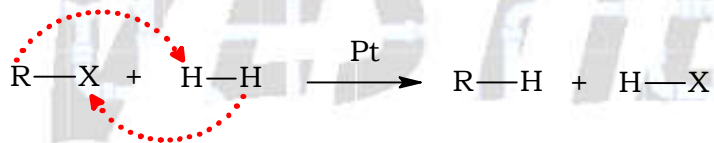
Síntese com Compostos de Grignard



Síntese de Friedel-Crafts

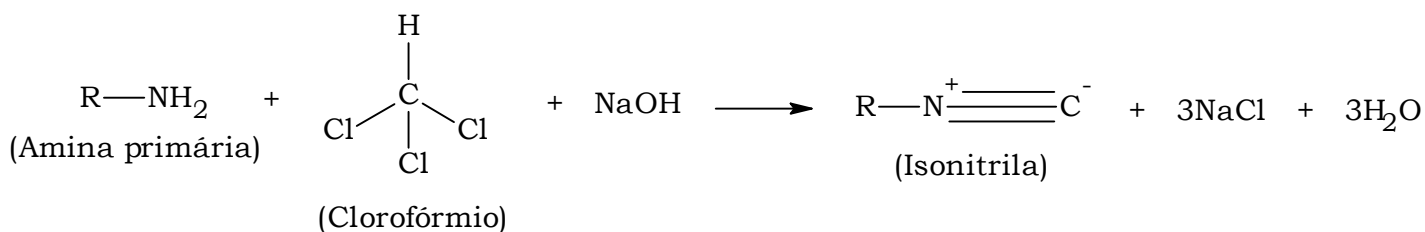


Redução de Haletos

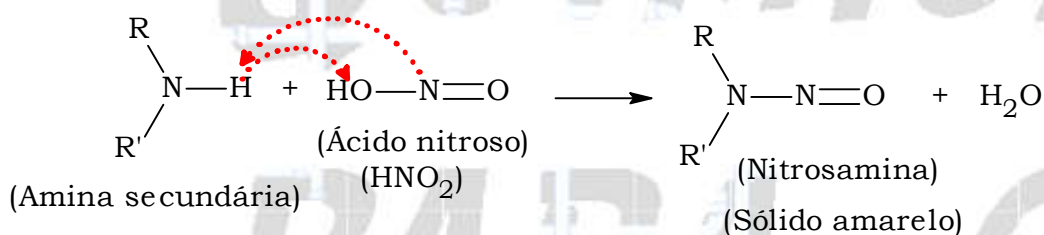
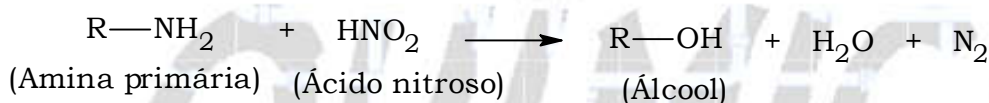


16) Aminas

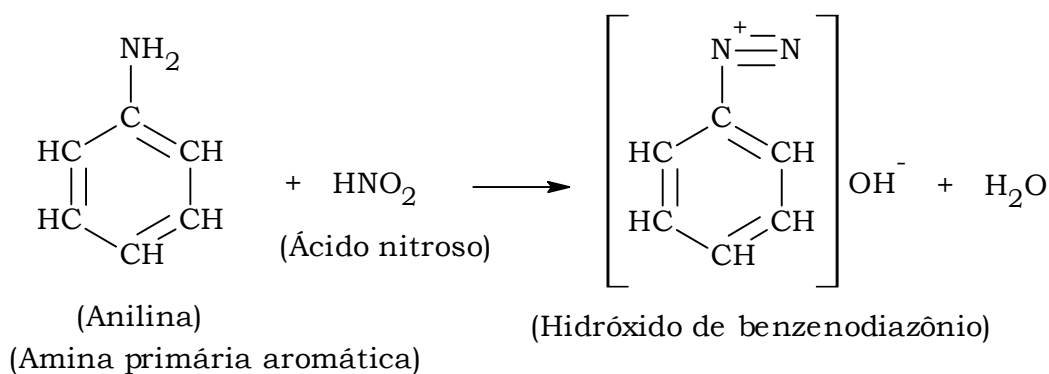
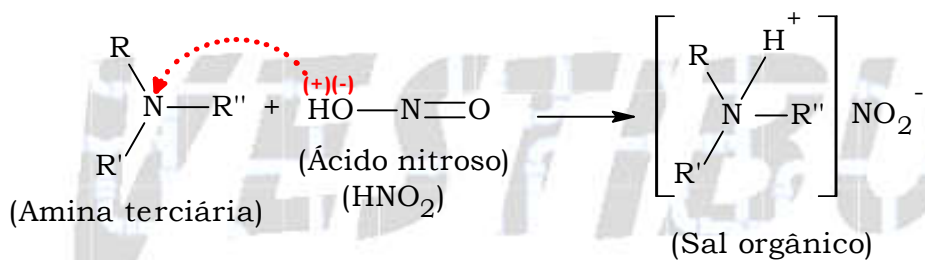
Apenas as aminas primárias reagem com clorofórmio em meio básico.



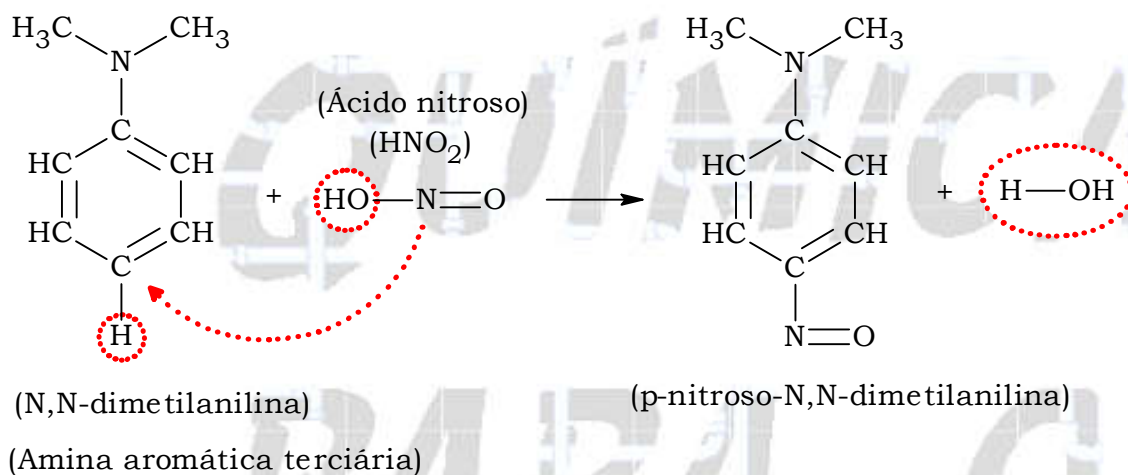
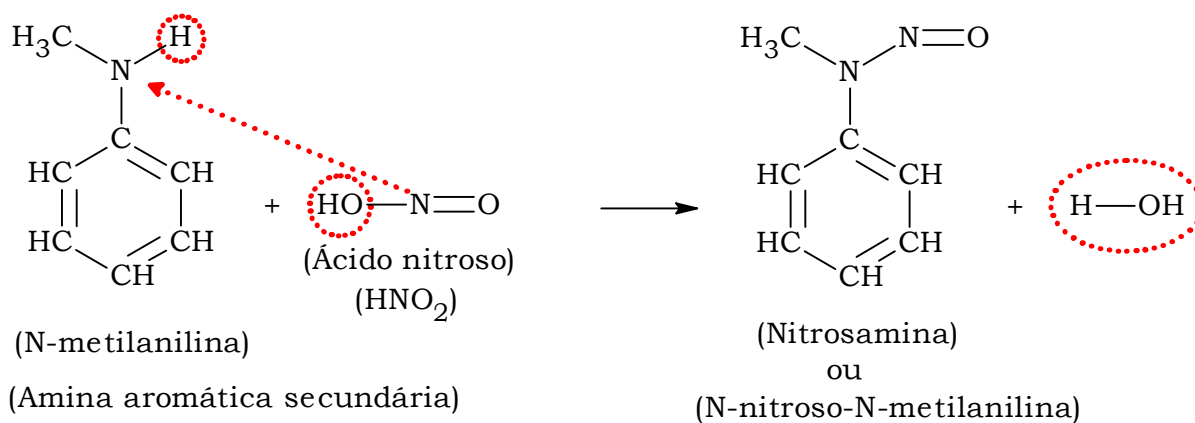
Reações com ácido nitroso (HNO₂)



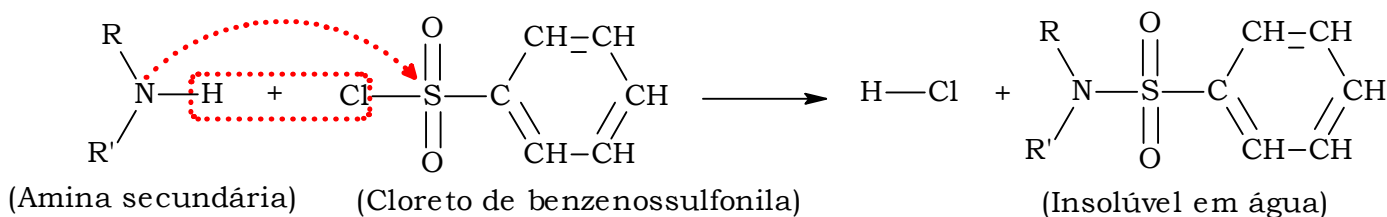
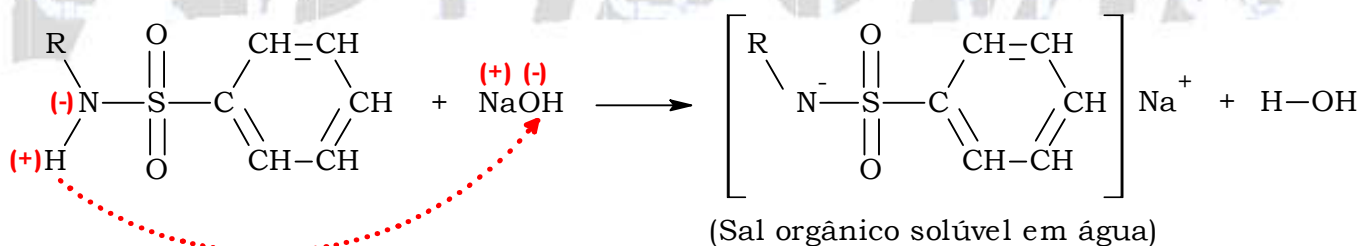
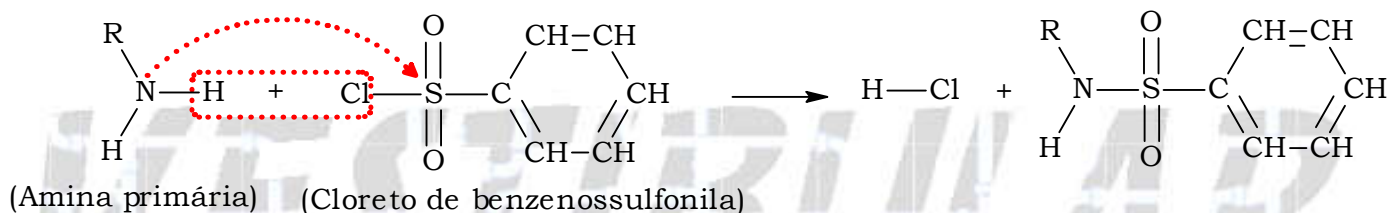
Reações com ácido nitroso (HNO₂)



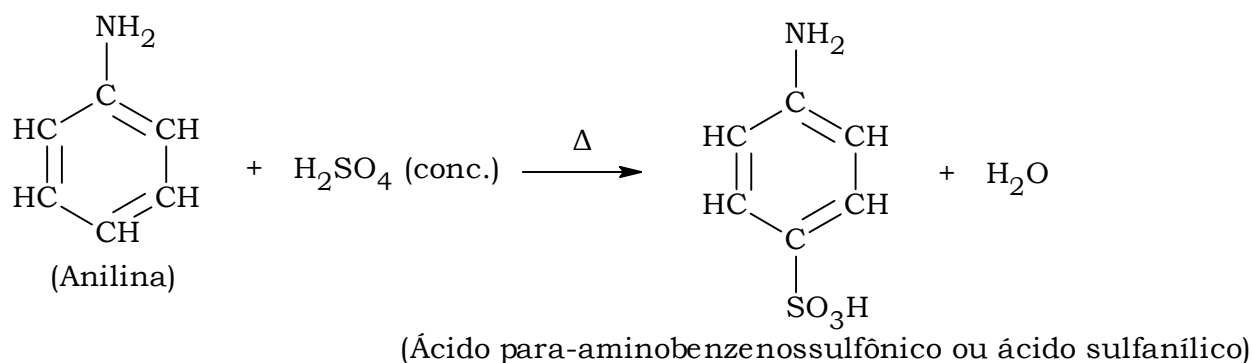
PROFESSORA SONIA
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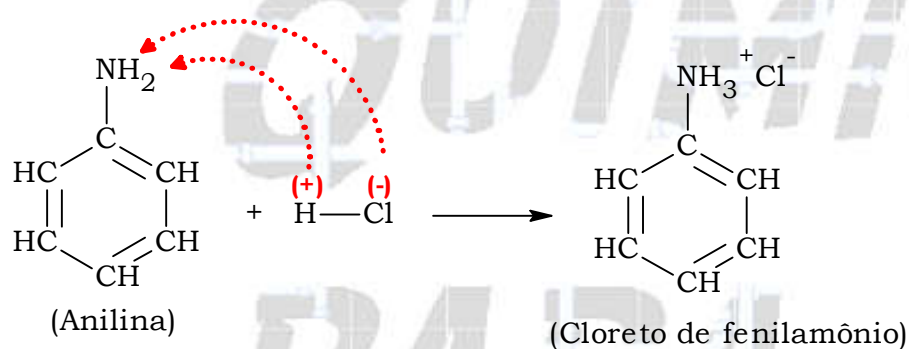
Método de Hinsberg



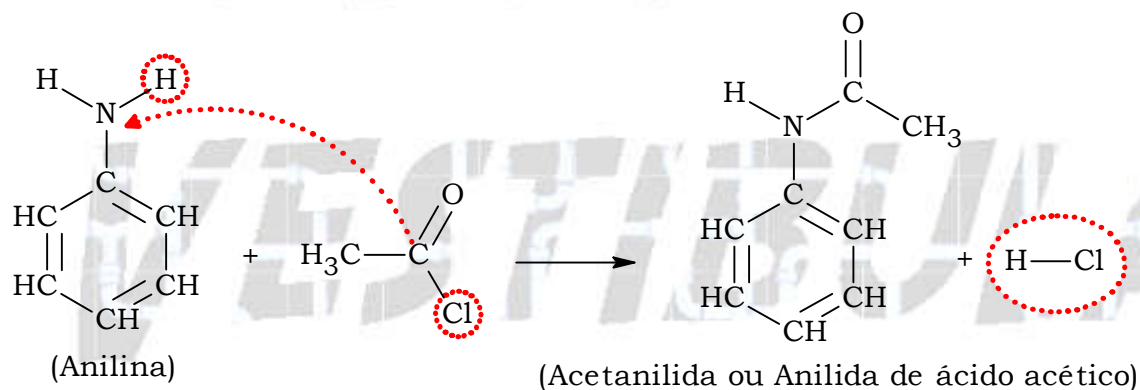
Reações da Anilina



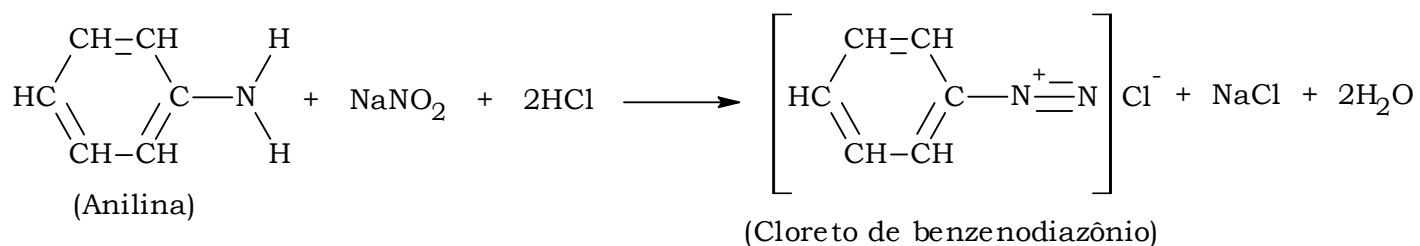
Reação da Anilina formando sal



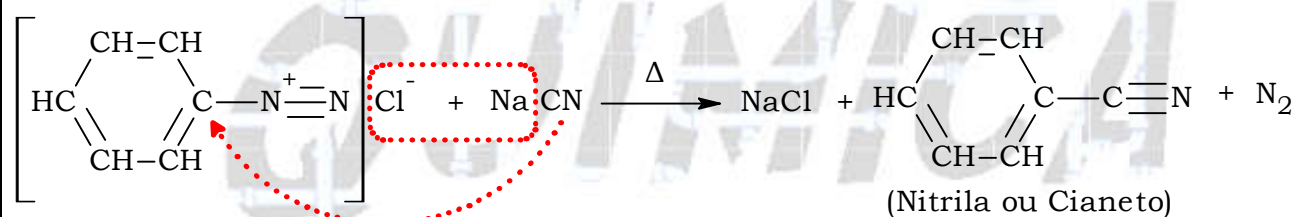
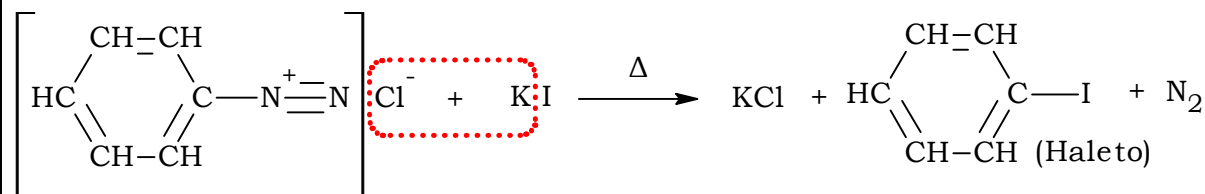
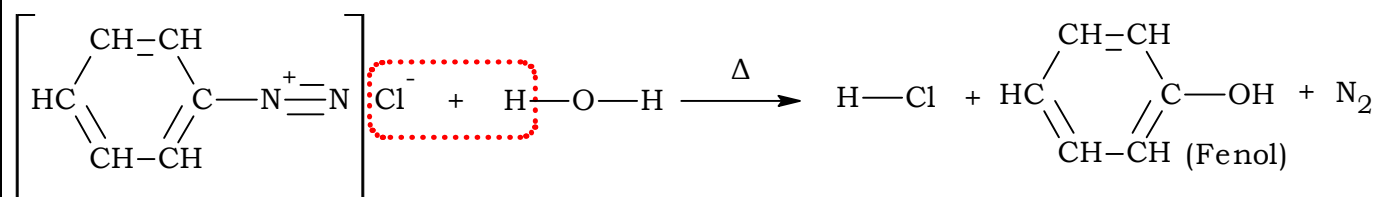
Reação de Acilação da Anilina formando Anilida



Reação de diazotação



Eliminação de gás nitrogênio

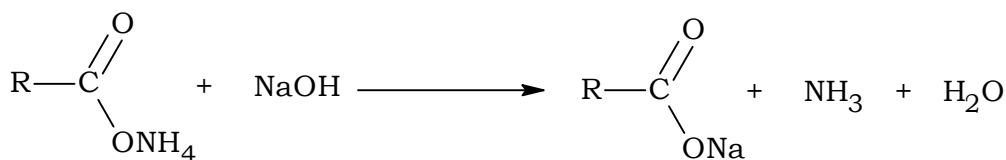
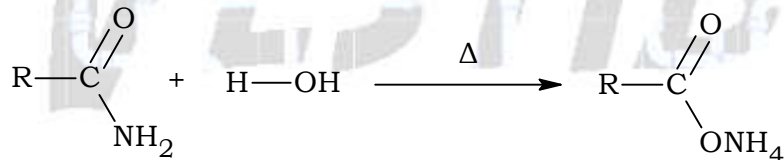


17) Amidas

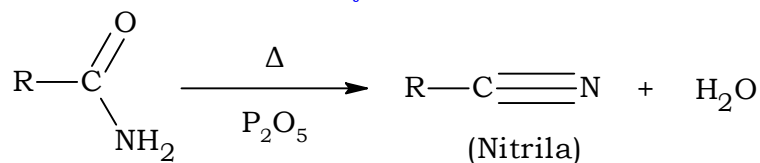
Caráter



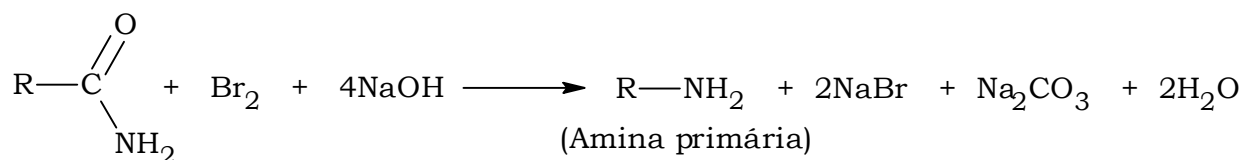
Caráter anfótero das Amidas



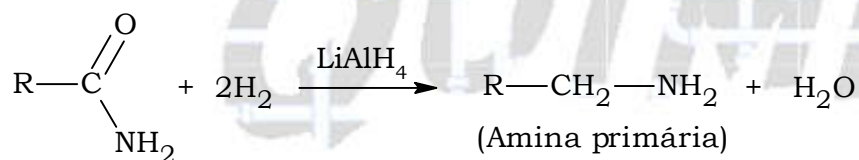
Desidratação



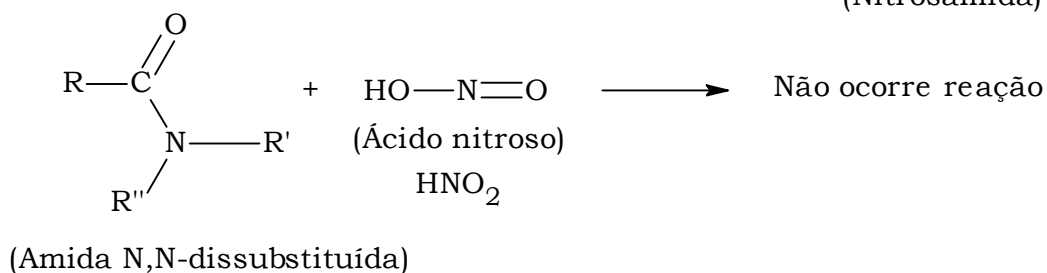
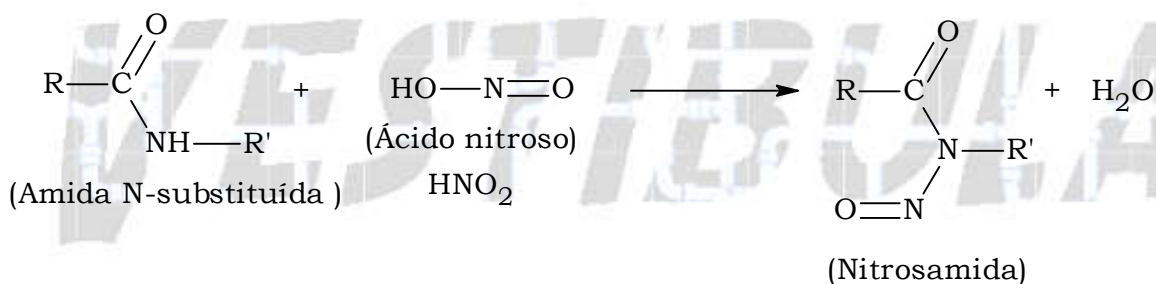
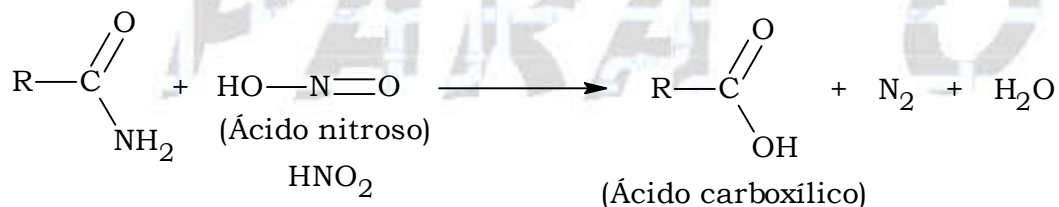
Reação com Halogênios em meio básico



Redução

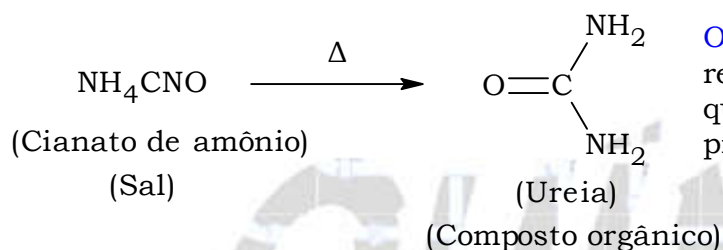
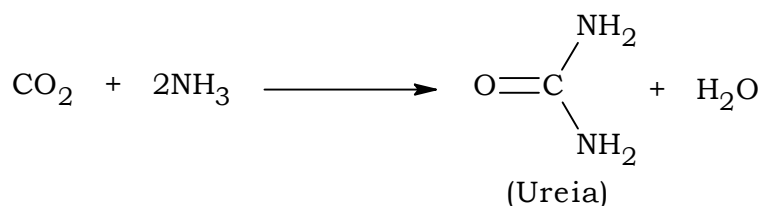


Reações com ácido nitroso



Grande incidência nos vestibulares!!

Ureia (diamida do ácido carbônico)

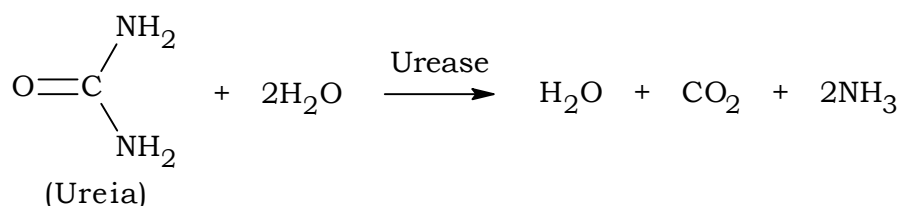
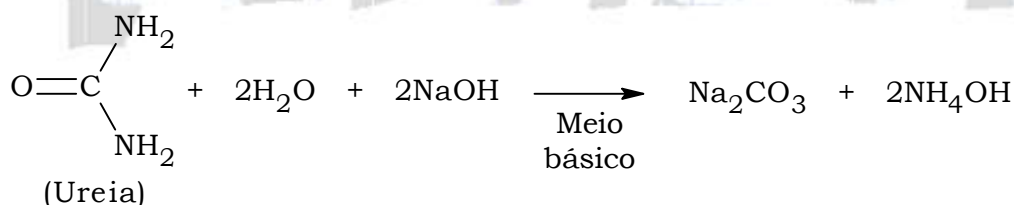
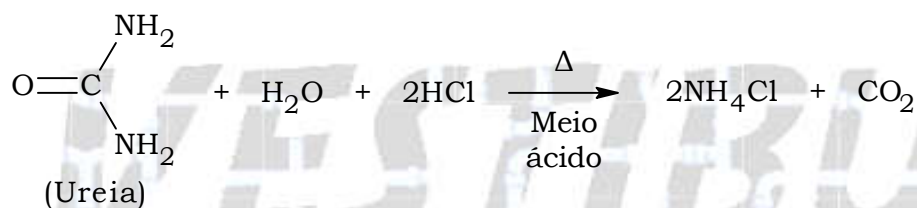


Observação: Wöhler (em 1928) utilizou esta reação para derrubar a "teoria da força vital", que dizia que apenas seres vivos poderiam produzir compostos orgânicos.

Caráter básico da Ureia

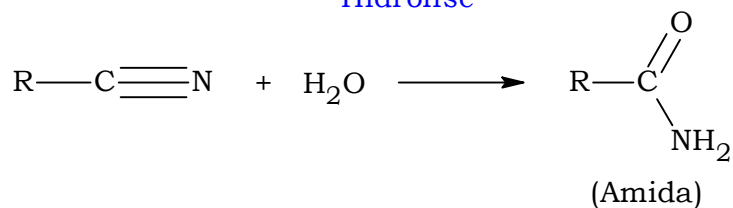


Hidrólise da Ureia

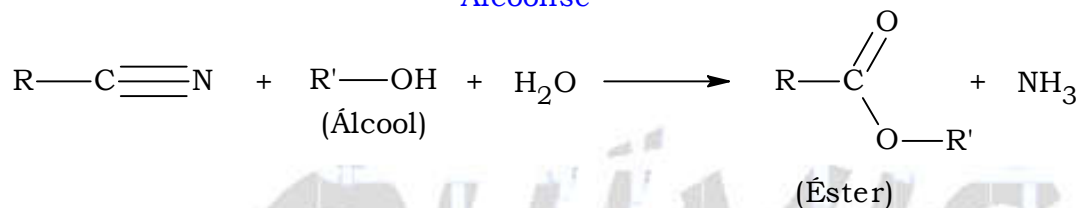


18) Nitrilas ou Cianetos de alquila

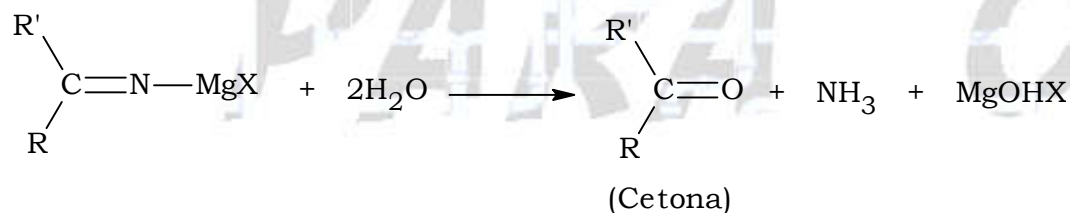
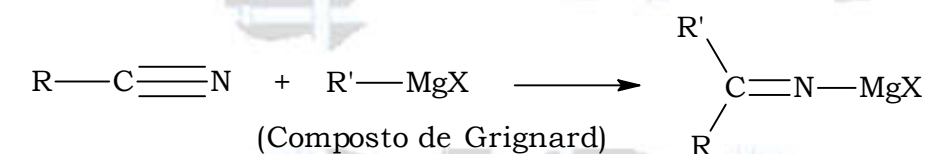
Hidrólise



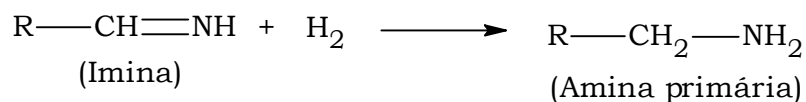
Alcoólise



Reação com Composto de Grignard

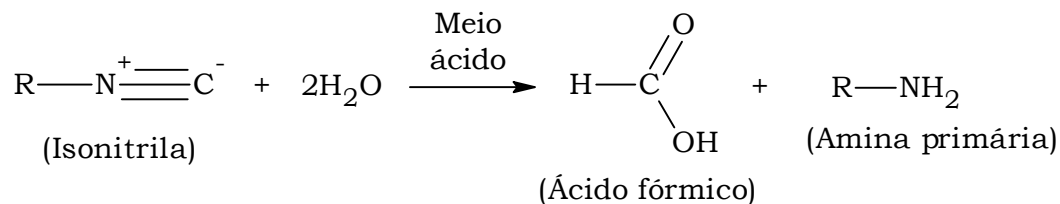


Redução feita com LiAlH_4 ou $(\text{Na} + \text{C}_2\text{H}_5\text{OH})$ ou $(\text{H}_2 + \text{Ni})$

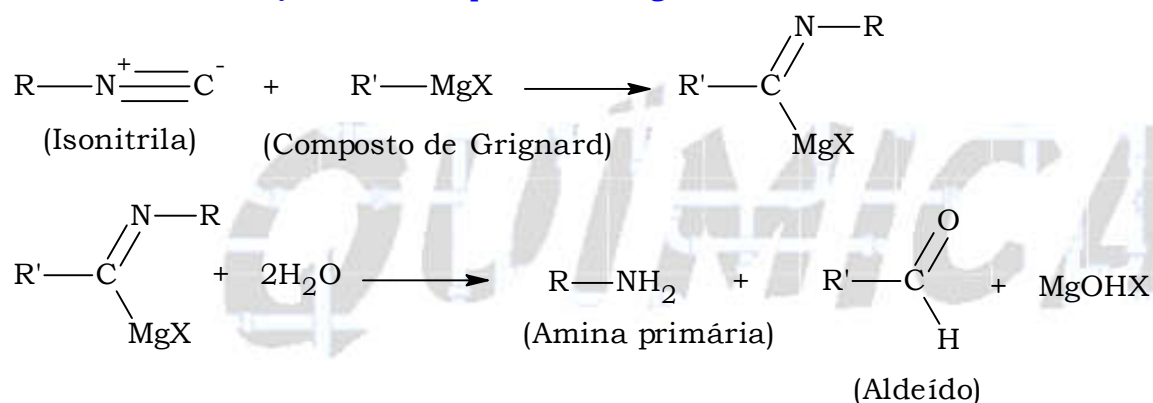


19) Isonitrilas ou Carbilaminas ou Isocianetos de alquila

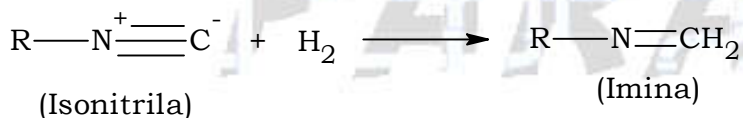
Hidrólise



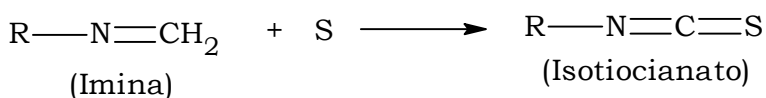
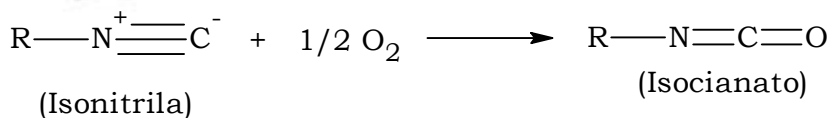
Reação com Composto de Grignard



Redução

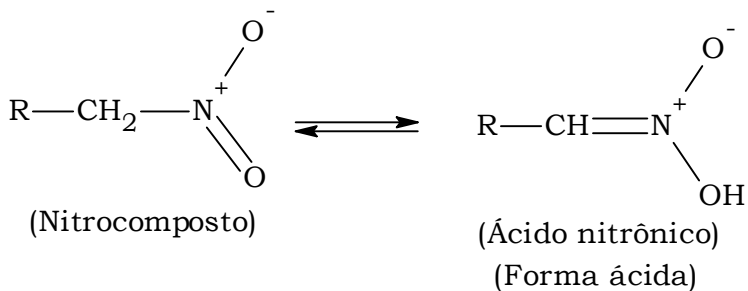


Adição

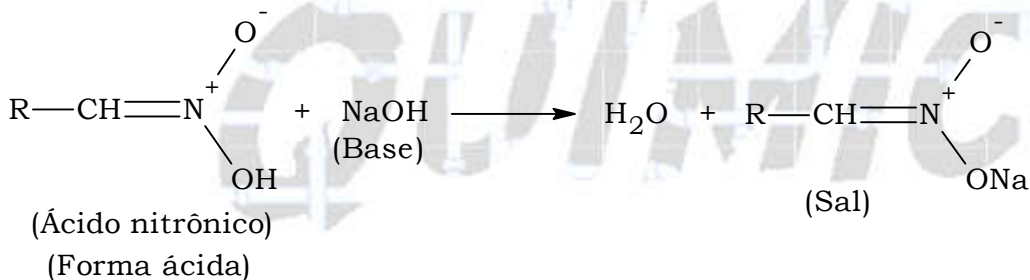


20) Nitrocompostos

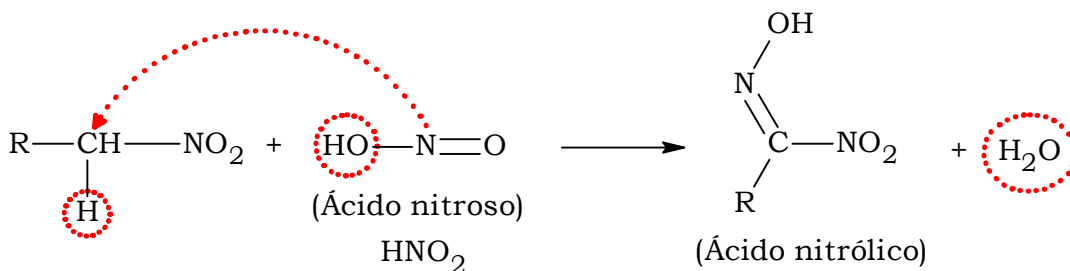
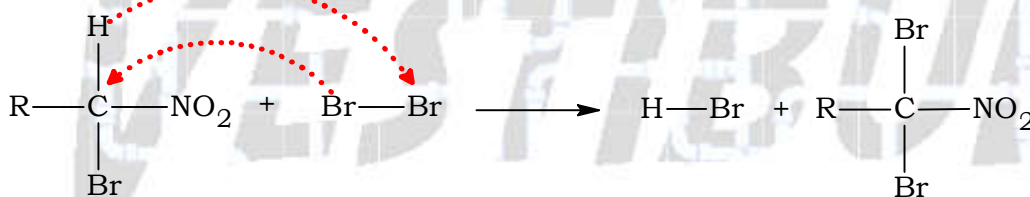
Equilíbrio químico (semelhante à tautomeria)

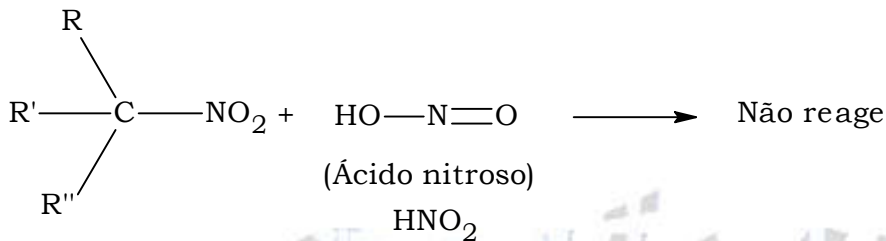
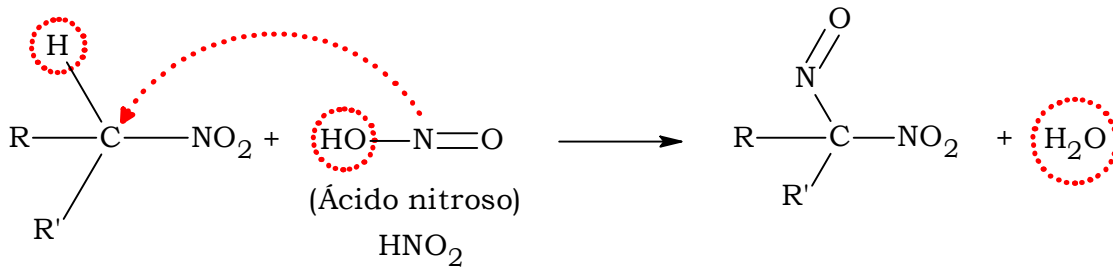


Caráter ácido

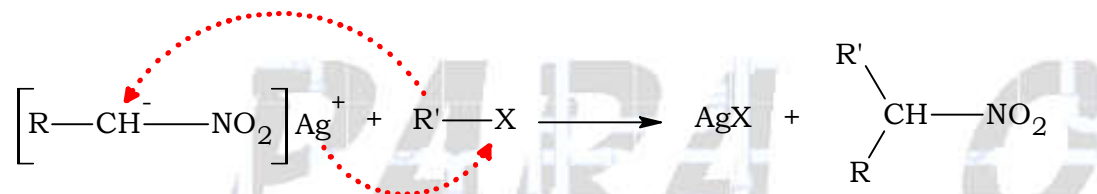
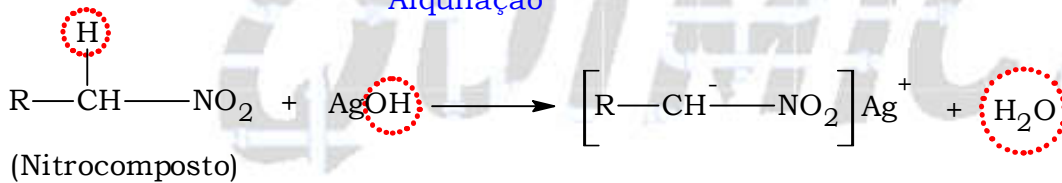


Substituições

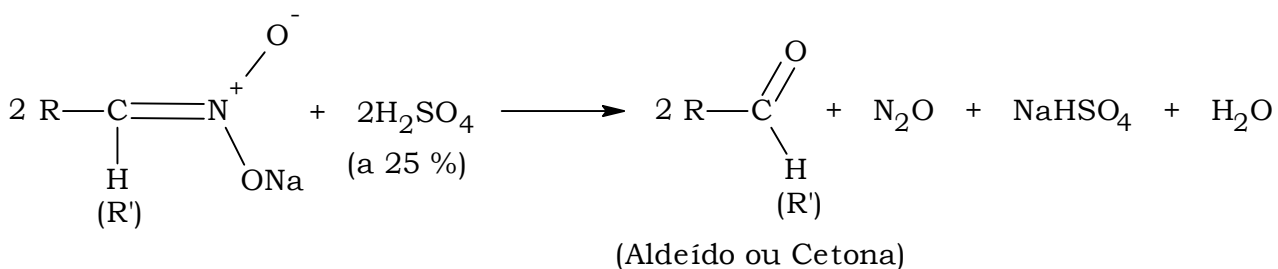
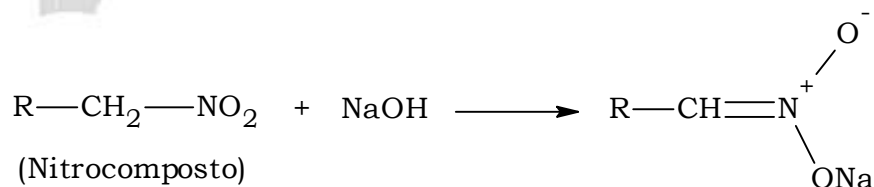
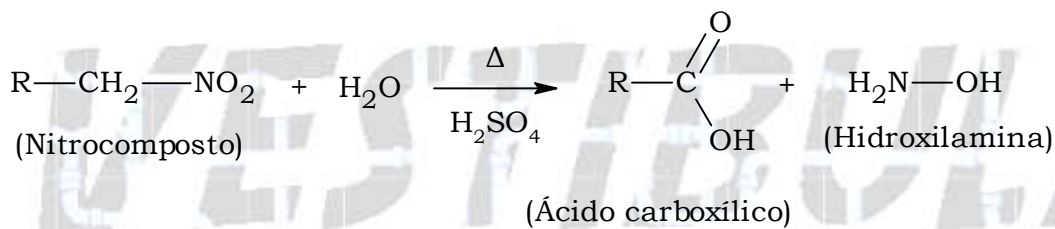




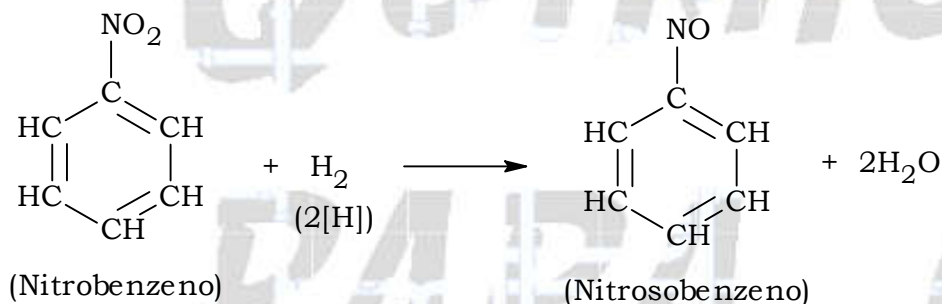
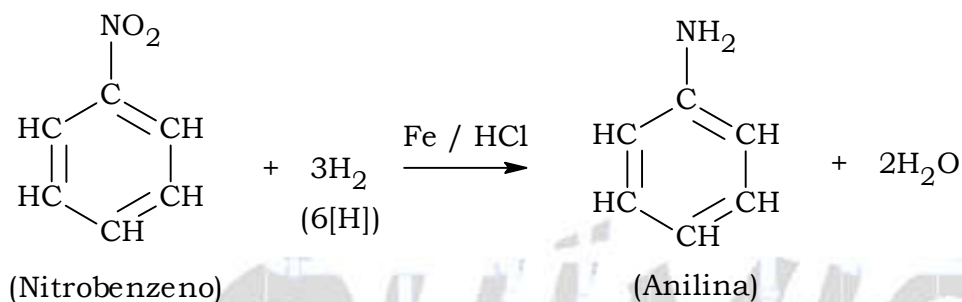
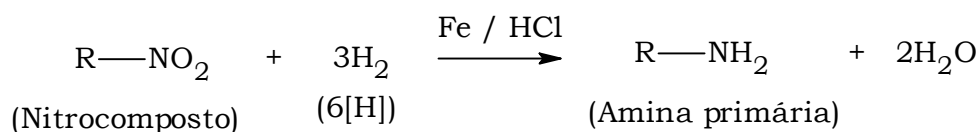
Alquilação



Hidrólise



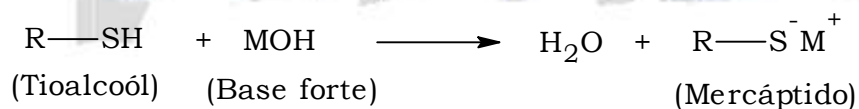
Redução



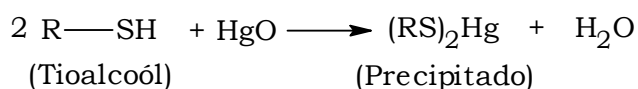
21) Compostos sulfurados: Tioalcoóis, Tioéteres, Ácidos Sulfônicos e Sulfatos

Tioalcoóis, Tióis ou Mercaptanas

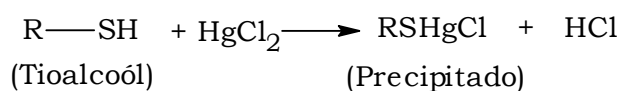
Reações com bases fortes



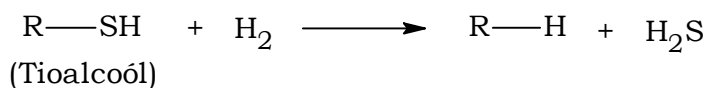
Reações com compostos formados por metais pesados



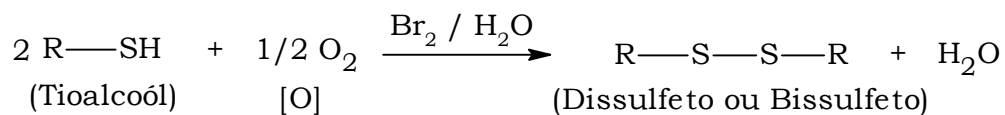
Observação: Os **Tióis** são chamados de **mercaptanas** (**mercúrio** + **captans** ou captador de mercúrio), pois causam a precipitação dos íons de mercúrio.



Redução



Oxidação branda

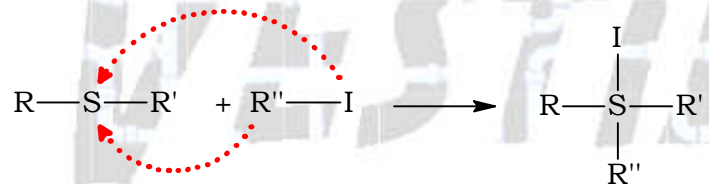
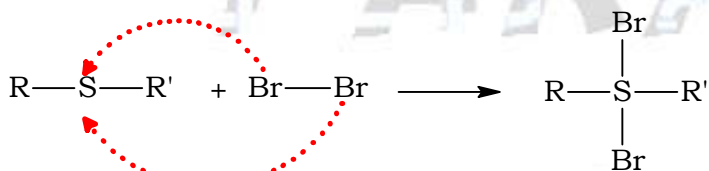


Oxidação enérgica

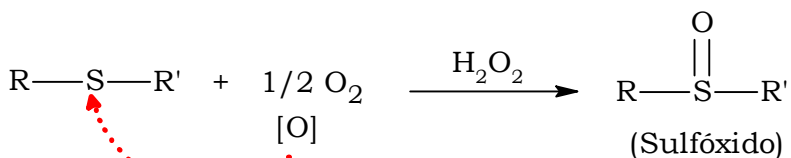


Tioéteres ou Sulfetos

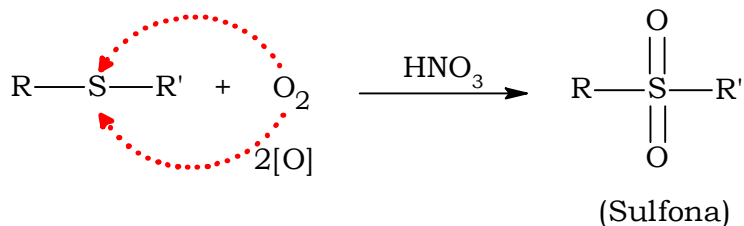
Adição



Oxidação branda

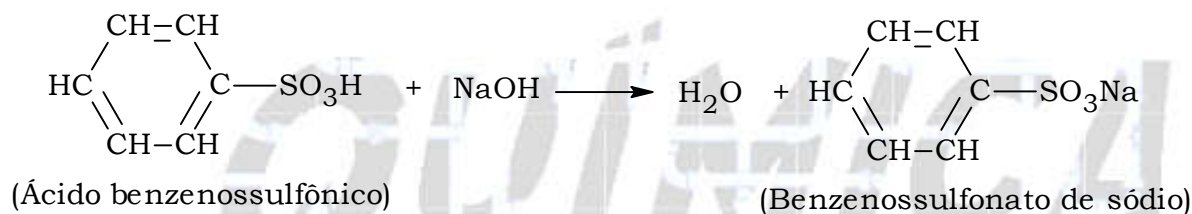


Oxidação enérgica

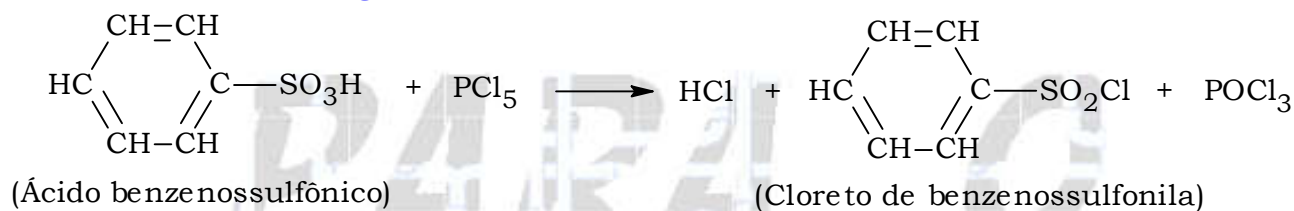


Ácidos sulfônicos

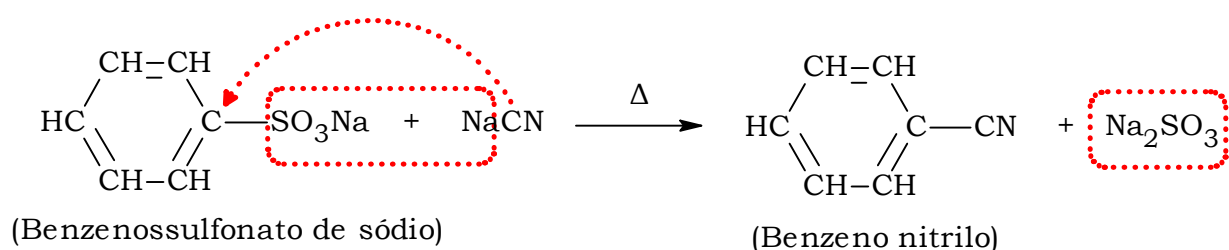
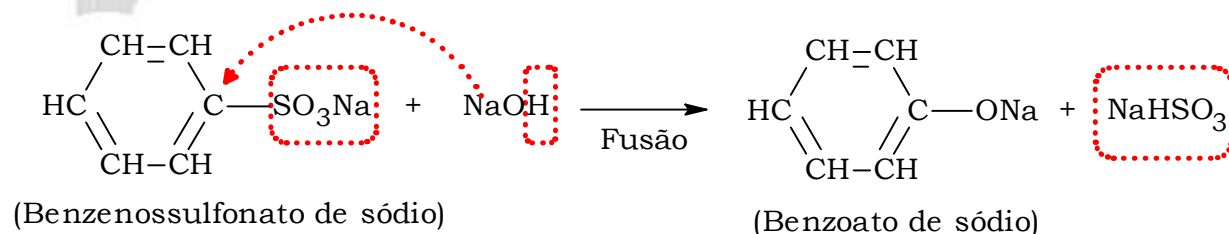
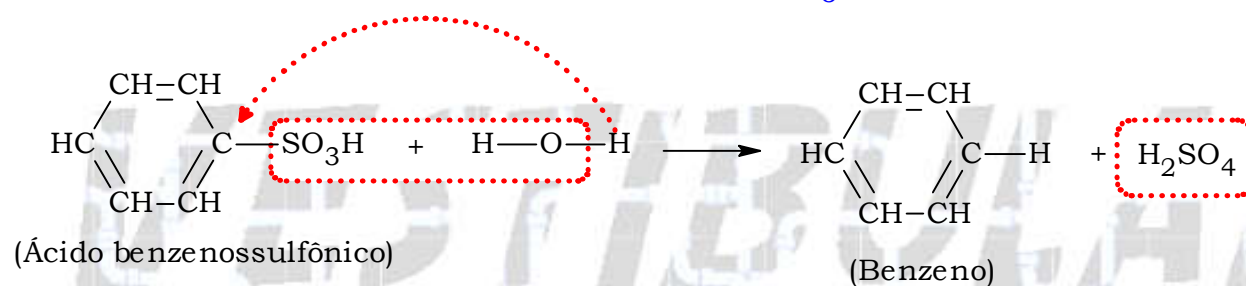
Reação com base



Reação com fósteto halogenado

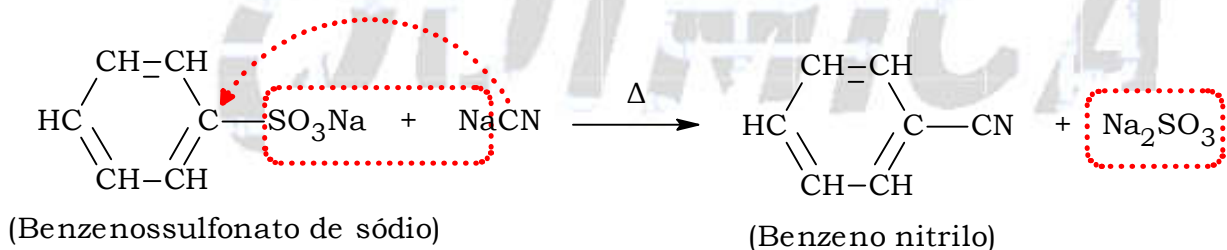
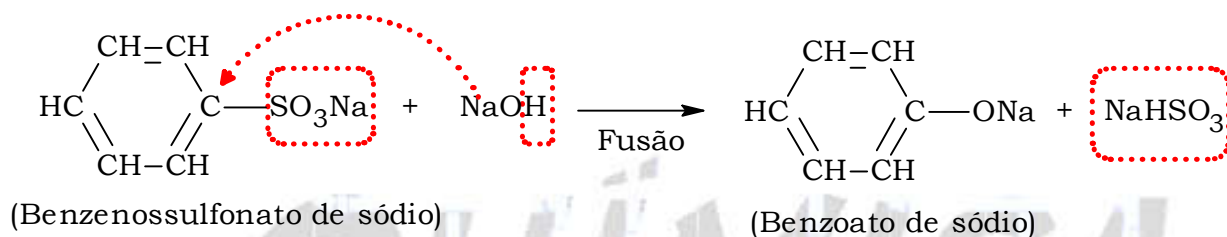
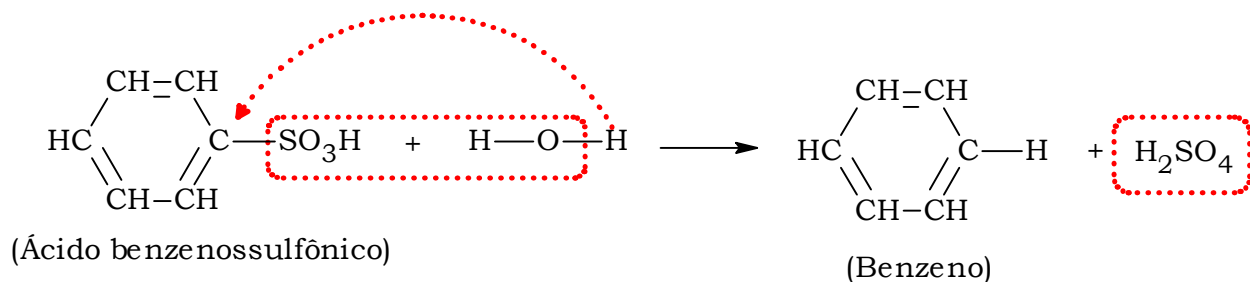


Substituição do grupo SO₃H

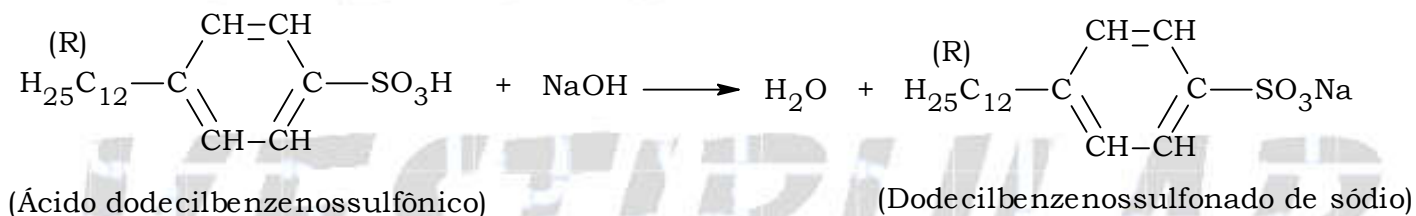


PROFESSORA SONIA
AS REAÇÕES ORGÂNICAS DOS VESTIBULARES

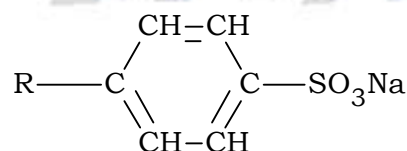
Substituição do grupo SO_3H



Detergente (Grande incidência nos vestibulares!)



(DETERGENTE)



Sulfatos

