

# Electrophilic Attack On Benzene

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from chapter(s) \_\_\_\_\_ in the recommended text

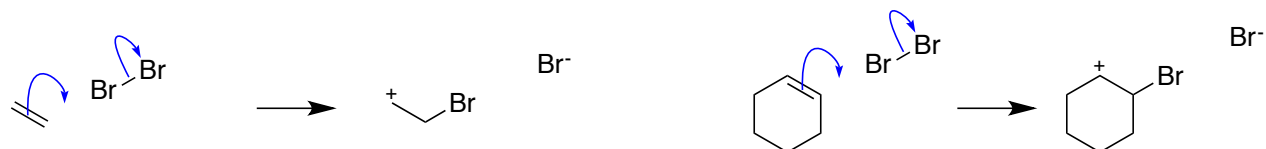
## A. Introduction

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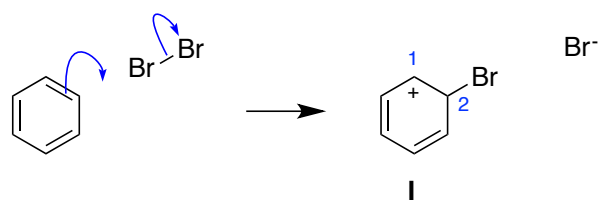
## B. Electrophilic Bromination Of Alkenes And Benzene Compared

### First Step: Approach Of Electrophile

*is not*



*do* distribute



1 hydrogen atoms on C<sup>1</sup> and 1 on C<sup>2</sup>.

*faster* than on benzene because for benzene *aromatic*

### Second Step: Loss Of Positive Charge

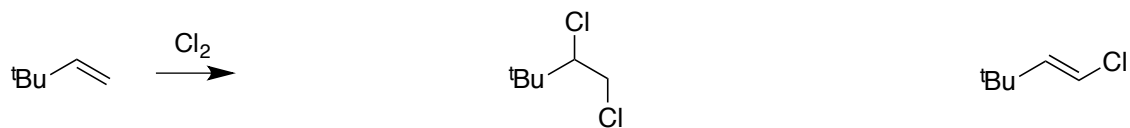
*proton.*

*aromatic*



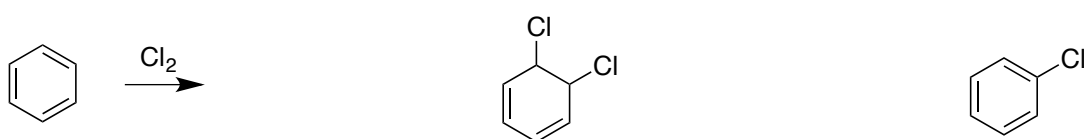
addition

substitution



*addition product*

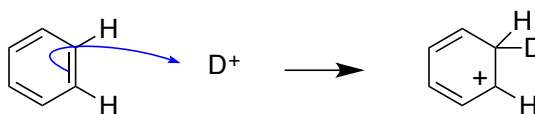
*possible substitution product*



*addition product*

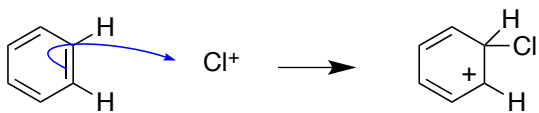
*substitution product*

heavier isotope  
the same as to  
attracted to)

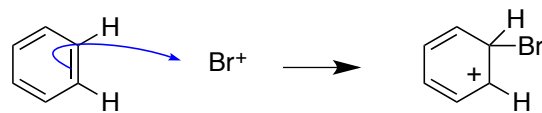


intermediate  
non-aromatic.

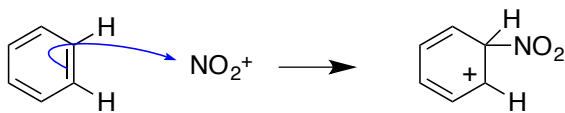
loses  
slow.



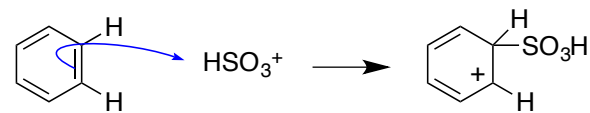
$\text{Cl}^+$



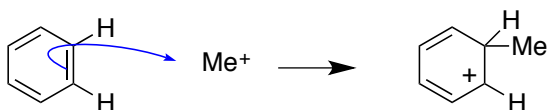
$\text{Br}^+$



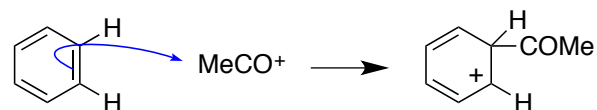
a nitronium ion,  $\text{NO}_2^+$



a sulfonium ion,  $\text{HSO}_3^+$

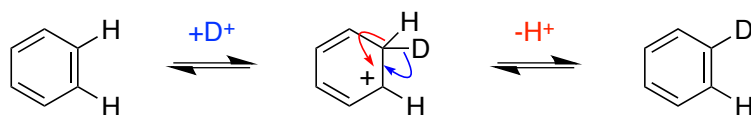


a methyl carbocation,  $\text{Me}^+$



an acylium ion,  $\text{MeCO}^+$

reversible.

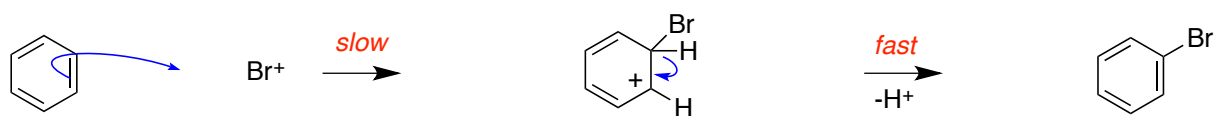
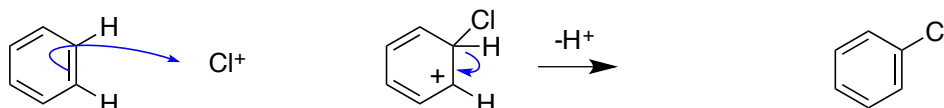


## C. Halogenation Of Benzene

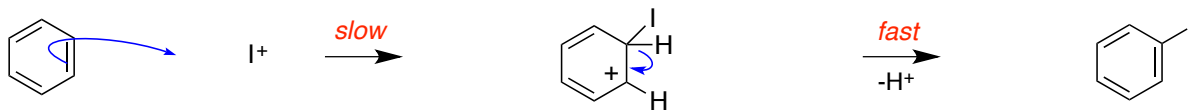
insufficiently



acid



bromination



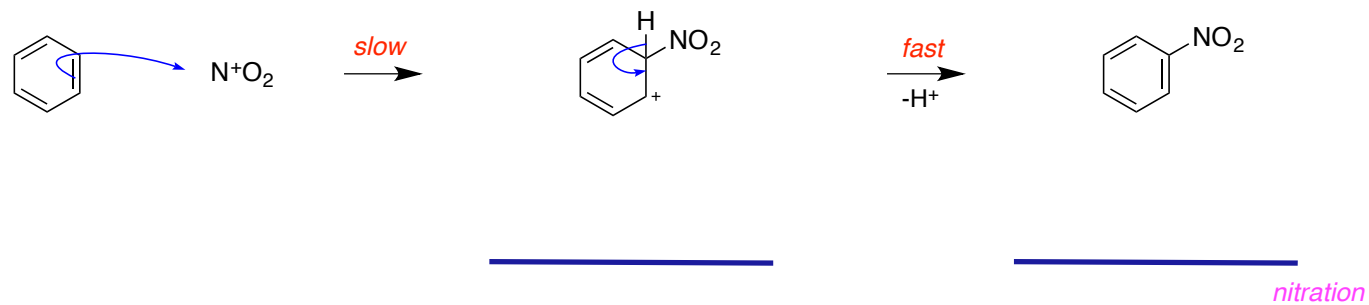
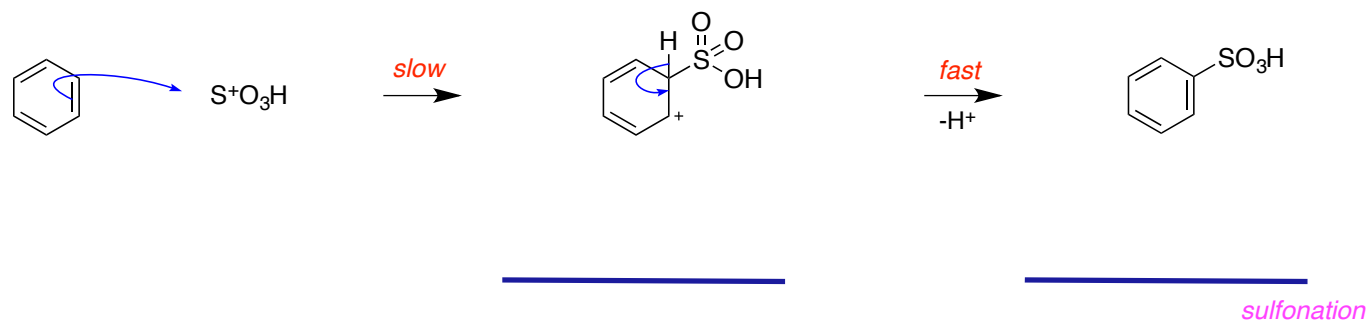
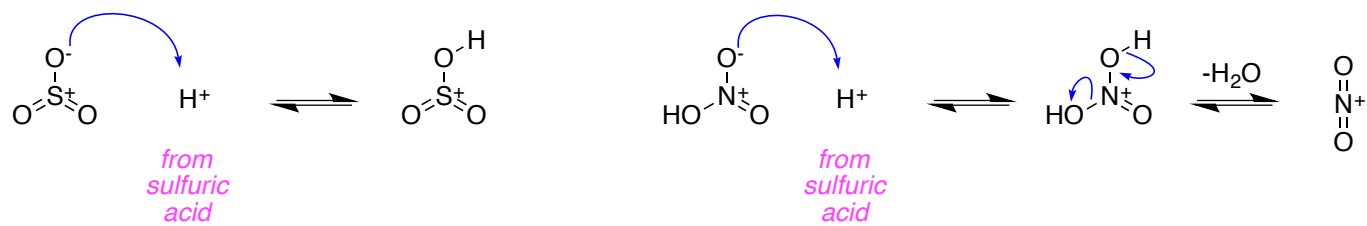
iodination

## D. Sulfonation And Nitration Of Benzene

strong

oleum.

protonating.



## E. Acylation Of Benzene (Friedel-Crafts)

### acylium ions

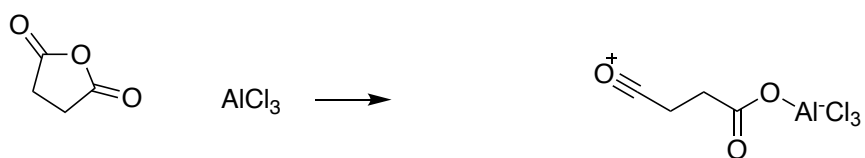



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acylium

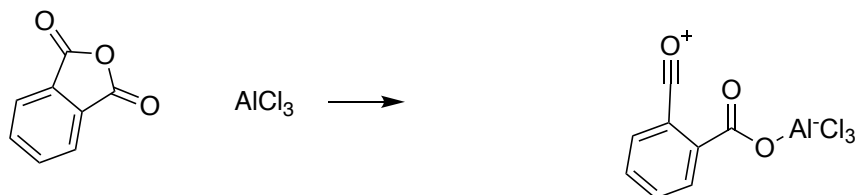
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acylium



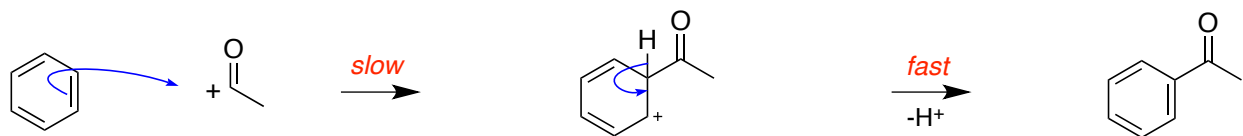
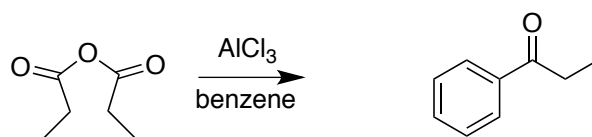
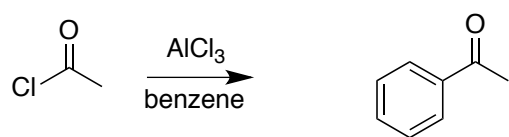

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acylium

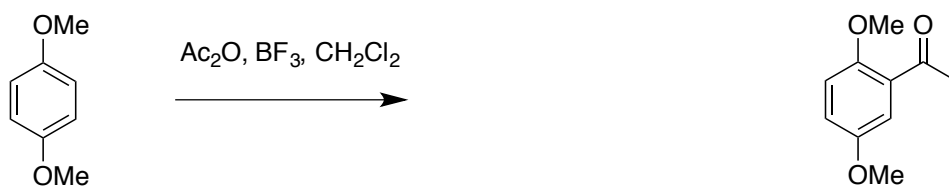



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acylium

ketones.less electron richdo not tend to





equivalent.

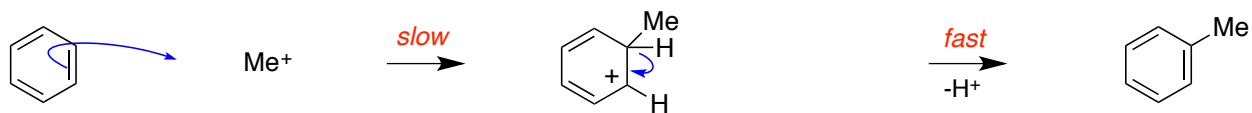
## F. Alkylation (Friedel-Crafts)

carbocations.

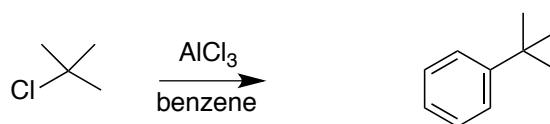
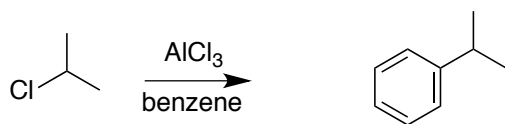
Lewis acids



do not  
not to be  
is not a concern

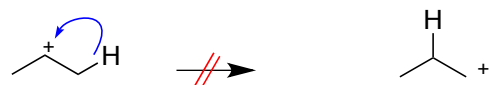
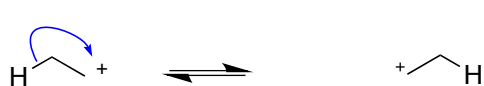


methylation

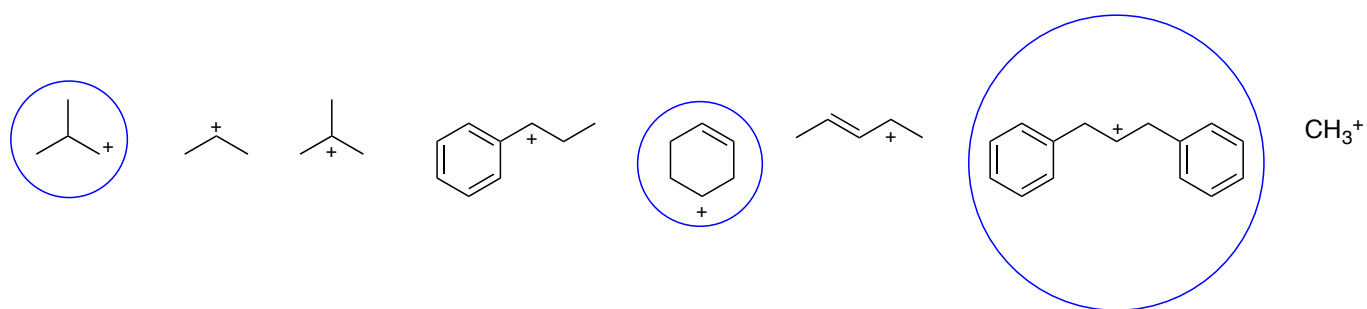


alkylbenzenes, these are more do are

Carbocation Rearrangements Revisited  
hydride



more



decreases

