

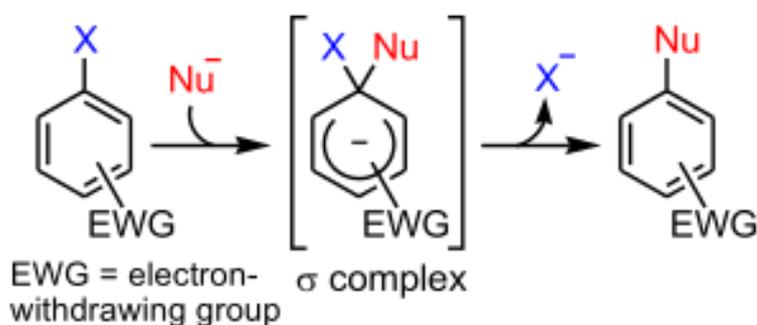
## Answer on Question#60079 - Chemistry - Organic Chemistry

Nucleophilic aromatic substitutions occur via \_\_\_\_\_.

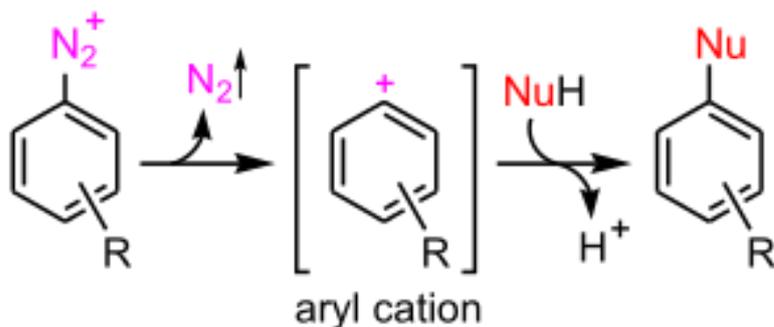
### Answer:

A nucleophilic aromatic substitution is a substitution reaction in organic chemistry in which the nucleophile displaces a good leaving group, such as a halide, on an aromatic ring. There are 6 nucleophilic substitution mechanisms encountered with aromatic systems:

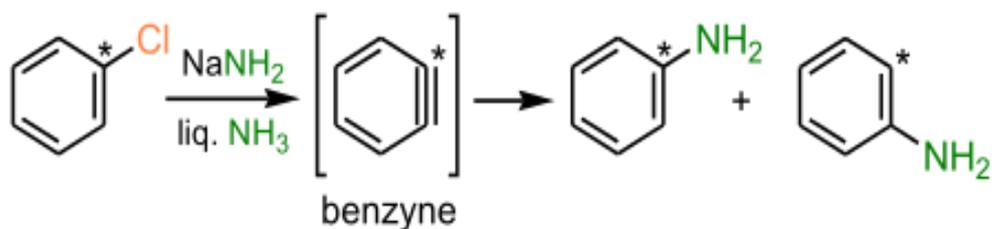
- the  $S_NAr$  (addition-elimination) mechanism



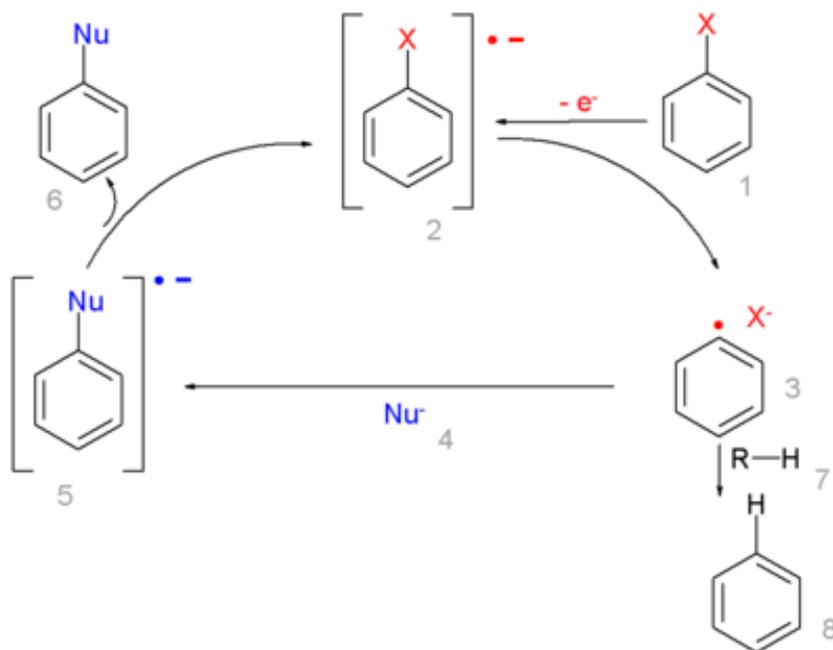
- the aromatic  $S_N1$  mechanism encountered with diazonium salts



- the benzyne mechanism

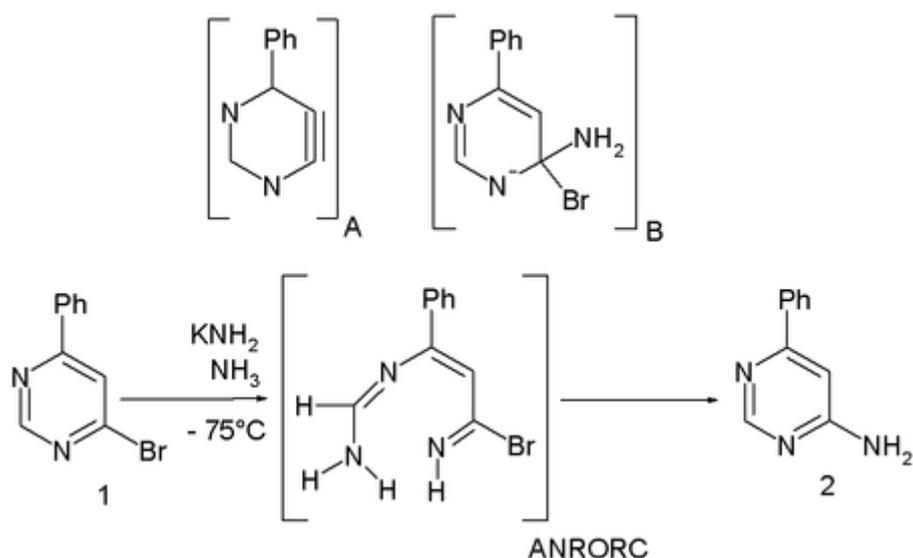


- the  $S_{RN}1$  mechanism



- the ANRORC mechanism

This reaction mechanism has been extensively studied in reactions of metal amide nucleophiles (such as sodium amide) and substituted pyrimidines (for instance 4-phenyl-6-bromopyrimidine 1) in ammonia at low temperatures. The main reaction product is 4-phenyl-6-aminopyrimidine 2 with the bromine substituent replaced by an amine. This rules out the formation of an aryne intermediate A which would also give the 5-substituted isomer.



### Vicarious nucleophilic substitution

In organic chemistry, the **vicarious nucleophilic substitution** is a special type of nucleophilic aromatic substitution in which a nucleophile replaces a hydrogen atom on the aromatic ring and not leaving groups such as halogen substituents which are ordinarily encountered in  $S_NAr$ .

