

CAIE Chemistry A-level

Topic 32 - Hydroxy Compounds

(A level only)

Flashcards

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How do acyl chlorides react to form an ester?



How do acyl chlorides react to form an ester?

Acyl chlorides react with primary alcohols to form esters. Hydrogen chloride (hydrochloric acid) is also produced during the reaction.



What is the chemical equation for the reaction between ethanol and propanoyl chloride? Give the name of the ester formed



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The product $\text{CH}_3\text{CH}_2\text{COOCH}_2\text{CH}_3$ is ethyl propanoate.



How does phenol react with NaOH?



How does phenol react with NaOH?

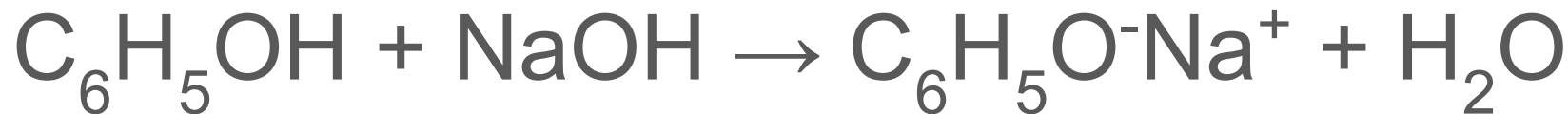
Phenol reacts with sodium hydroxide to form sodium phenoxide and water.



What is the chemical equation for the reaction of phenol with sodium hydroxide?



What is the chemical equation for the reaction of phenol with sodium hydroxide?



How does phenol react with sodium?



How does phenol react with sodium?

Phenol reacts with sodium to form sodium phenoxide and hydrogen gas.



What is the chemical equation for the reaction of phenol with sodium?



What is the chemical equation for the reaction of phenol with sodium?



How does phenol react with diazonium salts?

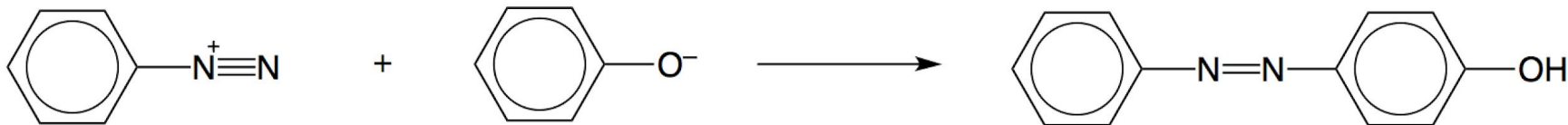


How does phenol react with diazonium salts?

In a coupling reaction:



The sodium phenoxide solution reacts with a benzenediazonium salt solution as follows:

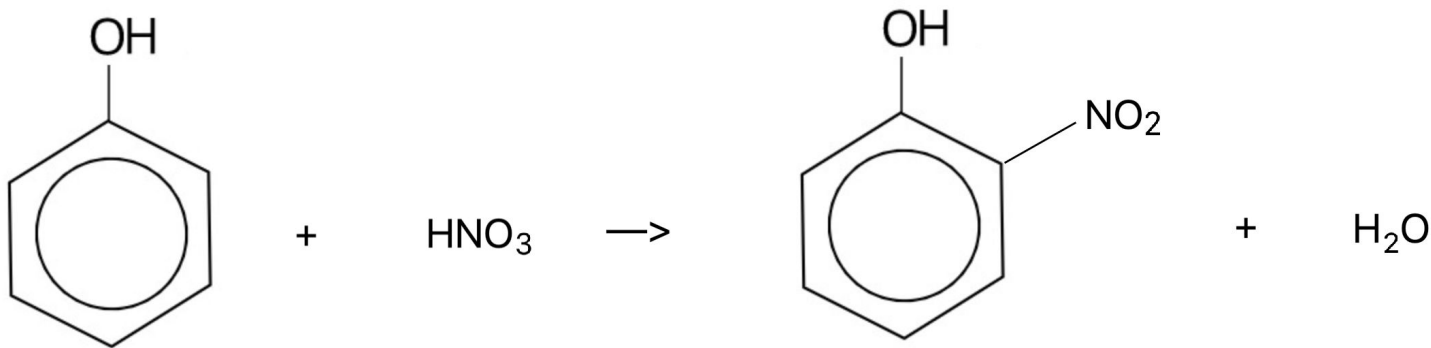


How does phenol react with dilute nitric acid?



How does phenol react with dilute nitric acid?

Phenol reacts readily with dilute nitric acid at room temperature to form a mixture of 2-nitrophenol and 4-nitrophenol.

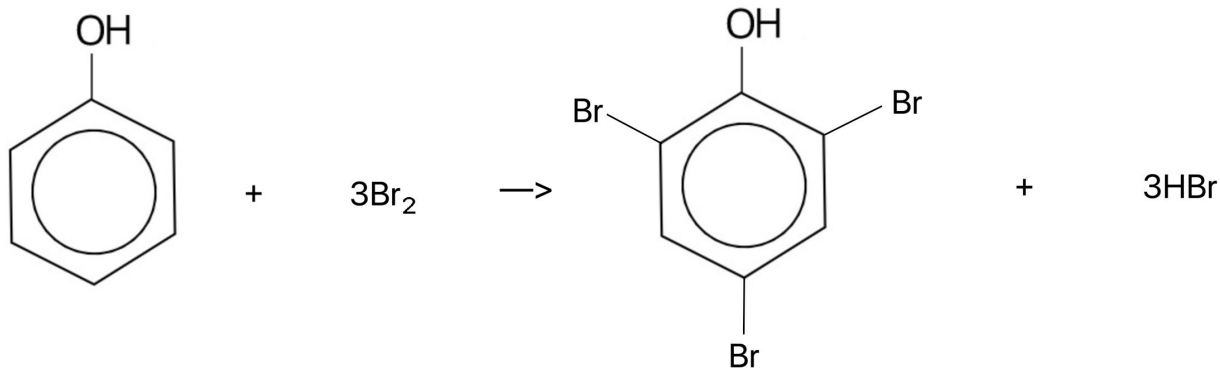


How does the bromination of phenol occur?



How does the bromination of phenol occur?

Phenol reacts with bromine to form a white precipitate of 2,4,6-tribromophenol.



What are the relative acidities of water, phenol and ethanol?



What are the relative acidities of water, phenol and ethanol?

Phenol > water > ethanol

Phenol is the most acidic.

Ethanol is the least acidic.



Explain the relative acidities of water,
phenol and ethanol



Explain the relative acidities of water, phenol and ethanol

- Phenol is the most acidic because the phenoxide ion is relatively stable. The lone pair on the oxygen atom is delocalised into the pi system meaning the negative charge is dispersed among the carbon atoms, so phenol is most likely to donate a hydrogen ion.
- Ethanol and water have similar acidities but ethanol is the least acidic. This is because of the positive inductive effect. The alkyl group in the ethoxide ion “pushes” electrons away from itself. This increases the electron density of the oxygen, making it more likely to bond to a hydrogen ion and reform ethanol.

