The Blanc chloromethylation (also called the Blanc reaction) is the chemical reaction of aromatic rings with formaldehyde and hydrogen chloride catalyzed by zinc chloride or other Lewis acid to form chloromethyl arenes. The reaction was discovered by Gustave Louis Blanc (1872-1927) in 1923. The reaction is performed with care as, like most chloromethylation reactions, it produces highly carcinogenic bis(chloromethyl) ether as a by-product.

Mechanism

The reaction is carried out under acidic conditions and with a ZnCl₂ catalyst. These conditions protonate the formaldehyde carbonyl making the carbon much more electrophilic. The aldehyde is then attacked by the aromatic π-electrons, followed by rearomatization of the aromatic ring. The benzyl alcohol thus formed is quickly converted to the chloride under the reaction conditions.

Although the reaction is an efficient means of introducing a chloromethyl group, the production of small amounts of highly carcinogenic bis(chloromethyl) ether is a disadvantage.

Related chloromethylations

Chloromethylation can also be effected using chloromethyl methyl ether:

\[ \text{ArH} + \text{CH}_3\text{OCH}_2\text{Cl} \rightarrow \text{ArCH}_2\text{Cl} + \text{CH}_3\text{OH} \]

This reaction is employed in the chloromethylation of styrene in the production of ion-exchange resins and Merrifield resins.