Preparation of Unsymmetrical Biaryls by the Diazo Reaction and the Nitrosoacetylamine reaction is an aryl-aryl coupling reaction via a diazonium salt. It is also known as the Gomberg–Bachmann reaction.

\[
\begin{align*}
&1 \quad \text{H} \quad \text{N}_2^+ \quad X \quad \text{OH}^- \\
&2 \quad \text{BrC}_6\text{H}_4\text{NH}_2 \quad \text{C}_6\text{H}_6 \\
&3 \quad \text{BrC}_6\text{H}_4\text{C}_6\text{H}_5
\end{align*}
\]

The arene compound 1 (here benzene) is coupled with base with the diazonium salt 2 to the biaryl 3 through an intermediate aryl radical. For example, p-bromobiphenyl may be prepared from 4-bromoaniline and benzene:

\[
\text{BrC}_6\text{H}_4\text{NH}_2 + \text{C}_6\text{H}_6 \rightarrow \text{BrC}_6\text{H}_4\text{C}_6\text{H}_5
\]

The reaction offers a wide scope for both diazonium component and arene component but yields are generally low following the original procedure (less than 40%), given the many side-reactions of diazonium salts. Several improvements have been suggested. One possibility is to employ diazonium tetrafluoroborates in arene solvent together with a phase-transfer catalyst, another is to use 1-aryl-3,3-dialkyltriazenes.

### Pschorr reaction

One intramolecular variation which gives better results is the Pschorr reaction:

\[
\begin{align*}
&\text{BrC}_6\text{H}_4\text{NH}_2 \quad \text{C}_6\text{H}_6 \\
&\text{N}_2^+ \quad \text{Z} \\
&\text{Z} \quad \text{Z}
\end{align*}
\]

The group Z can be \( \text{CH}_2 \), \( \text{CH}_2\text{CH}_2 \), \( \text{NH} \) and \( \text{CO} \) (to fluorenone) to name just a few.

### See also

- Graebe–Ullmann synthesis
- Meerwein arylation
- Sandmeyer reaction
References


Contributors

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