Nucleophilic Aromatic Substitution
Synthesis of 2,4-dinitroanisole (Please read Experiment 18.4, ignore kinetics)

Today's reaction:

\[
\begin{align*}
\text{Cl} & \quad \text{NO}_2 \\
\text{NO}_2 & \quad \text{NaOCH}_3 \\
\text{NO}_2 & \quad \text{CH}_3\text{OH} \\
\text{OCH}_3 & \quad \text{NO}_2 \\
\end{align*}
\]

+ NaCl

The Nucleophilic aromatic substitution is an organic reaction in which the nucleophile displaces a good leaving group, such as a halide, on an aromatic ring. A historically important reaction of this type involves the Sanger's reagent, where an N-terminal
amino group from a peptide displaces a fluorine atom on an aromatic ring. The Sanger's reagent was used to identify the sequence of peptide chains, especially for insulin.

![Sanger's reagent](image)

**Sanger's reagent**

Let us take a look at the Meisenheimer Complex, which is related to the mechanism of the nucleophilic aromatic substitution reactions.

![Meisenheimer complex](image)

R = H, OCH₃
R' = CH₃, CH₂CH₃
M = K, Na

Meisenheimer complex