If electrophilic aromatic substitution of a monosubstituted benzene is slower than that of benzene under identical conditions, the substituent in the monosubstituted benzene is called a deactivating group.

eg:

Under identical conditions, Reaction 2 is slower than Reaction 1. Thus, the nitro group is a deactivating group.

All deactivating groups are electron-withdrawing groups.

Common deactivating groups:

- \( \text{NO}_2 \)
- \( \text{NO} \)
- \( \text{NR}_3 \) (\( R = \text{H, alkyl, aryl, or any combination thereof} \))
- \( \text{C}=\text{R} \) (\( R = \text{H, alkyl, aryl, hydroxy, alkoxy, phenoxy, NH}_2 \))
- \( \text{X} \) (\( X = \text{F, Cl, Br, I} \))
- \( \text{CN} \)
- \( \text{SO}_3\text{H} \)

see also activating group, ortho, para directing group, meta directing group

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