

# Directing Groups

Pre-lesson assignment- textbook page 446-450

## Define the following terms

- Directing effect
- Activation of a benzene ring
- Deactivation of a benzene ring

## Make notes on the Chemistry of Phenol

*Use the following questions as guidance*

1. Explain in terms of electron density why chemicals like phenylamine and phenol activate a benzene ring.
2. Explain the effect of activating a benzene ring on a second substitution.
3. Explain in terms of electron density why other chemicals can deactivate benzene rings.
4. Explain the effect of deactivating a benzene ring on a second substitution.
5. Predict the effect of reacting bromine (and any necessary catalysts) to...
  - a. Phenylamine
  - b. Benzaldehyde
6. Suggest a way of making the following from benzene:
  - a. 4-bromonitrobenzene
  - b. 3-bromonitrobenzene