## **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

Now do all of the summary questions on pages 436,441,445,450