Diazonium Coupling With Phenol

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Response: Both statements are correct, and the second statement is the correct explanation for the first statement.

- **Statement 1:** Benzenediazonium chloride reacts with phenol in basic medium (NaOH) to form 4-hydroxyazobenzene (an orange-red azo dye via a coupling reaction).
- **Statement 2:** The benzenediazonium ion ($\mathrm{C_6H_5N_2^+}$) carries a positive charge (delocalized over the terminal nitrogen atom), allowing it to act as a weak electrophile.

Reaction Mechanism Overview: In mild basic medium (NaOH), phenol converts into the phenoxide ion ($\mathrm{C_6H_5O^-}$), which is significantly more electron-rich than neutral phenol. The electrophilic benzenediazonium ion then attacks the activated *para*-position of the phenoxide ion to yield 4-hydroxyazobenzene.
