

Chemguide – answers

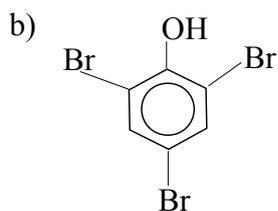
PHENOL: RING REACTIONS

1. a) An activating group makes the ring more reactive than it is in benzene itself. One of the lone pairs on the oxygen atom in the OH group overlaps with the delocalised benzene ring electrons and itself becomes delocalised. That extra movement of electrons towards the ring increases the electron density on the ring.

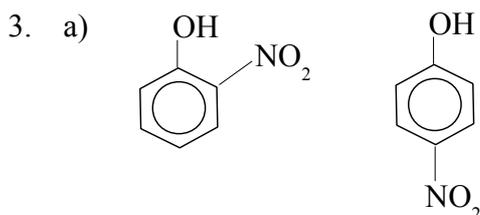
The ring is attacked by things carrying a full or partial positive charge. Increasing the electron density around the ring makes it even more attractive to such things.

b) This means that incoming groups will substitute into the 2- or 4- positions relative the OH group, where the ring carbon with the OH attached counts as the number 1 position. That means that the incoming groups attach next door to the OH group or opposite it.

2. a) The bromine water is decolourised, and a white precipitate is formed, smelling of antiseptic. If you are testing for an alkene, although the bromine water is again decolourised, you don't get a white precipitate.



2,4,6-tribromophenol



b) Nitric acid is an oxidising agent, and phenol is easily oxidised to give complex tarry products.

