

Chemguide – answers

PHENOL: INTRODUCTION

1. a) The first diagram shows the benzene ring with its delocalised electrons attached to an oxygen atom with two lone pairs. One of the lone pairs is lined up in such a way as to be able to delocalise to some extent with the ring electrons.

The second diagram show the result of that delocalisation, so that one of the lone pairs is now involved with the ring delocalisation.

- b) The lone pair's involvement with the ring electrons adds electron density to the ring. The ring reactions depend on the attractiveness of the delocalised electrons to other things, and this has increased.
2. a) van der Waals dispersion forces, dipole-dipole attractions, and hydrogen bonds.
 - b) (i) It can form hydrogen bonds with water molecules.
(ii) In the top layer, a solution of phenol in water. In the bottom layer, a solution of water in phenol.