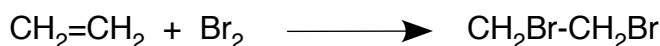


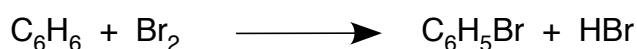
Chemguide – questions

THE KEKULÉ STRUCTURE FOR BENZENE

- a) Benzene has the molecular formula C_6H_6 . Draw the Kekulé structure for this showing all the atoms.
b) Now draw the skeletal structure showing the way the Kekulé structure is normally drawn.
- Ethene and benzene react with bromine in quite different ways. With ethene, bromine reacts with an addition reaction:

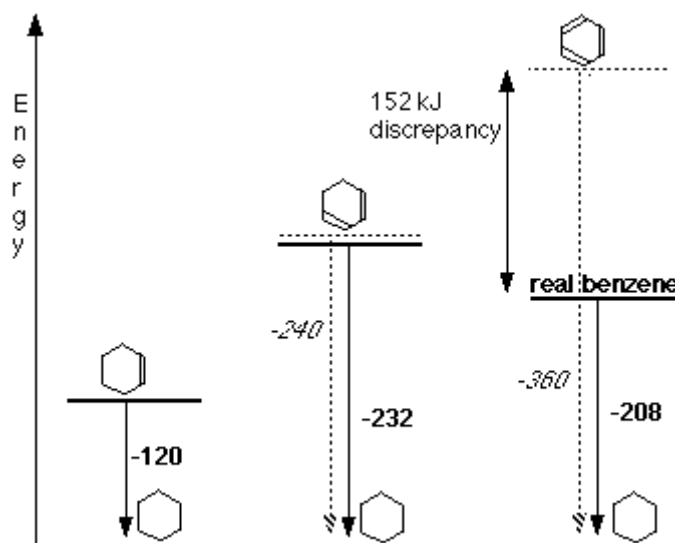


With benzene, you get a substitution reaction in which one of the hydrogen atoms is replaced by a bromine:



Explain why this throws doubt on the accuracy of the Kekulé structure.

- The carbon atoms in a benzene molecule are arranged in a perfect hexagon. Explain why this is inconsistent with the Kekulé structure.
- The following diagram shows the amount of energy released when a number of ring compounds react with hydrogen to form cyclohexane.



The dotted lines represent values for the amount of heat released estimated from the cyclohexene value. Solid lines represent the actual amounts of heat released from the real compounds.

- Why is it reasonable to think that the value for the middle compound would be twice that of cyclohexene?
- What does the large discrepancy between the real and estimated values for benzene show?