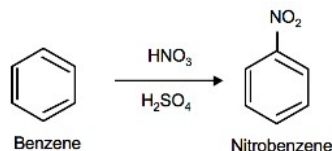


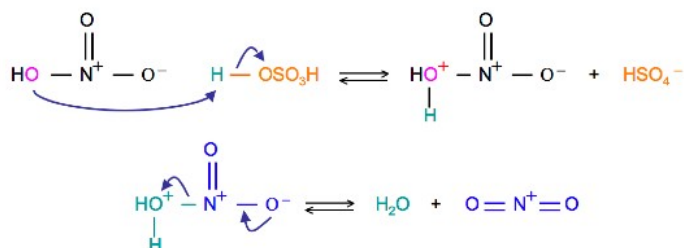
18.3: NITRATION OF BENZENE (AN EAS REACTION)

NITRATION OF BENZENE

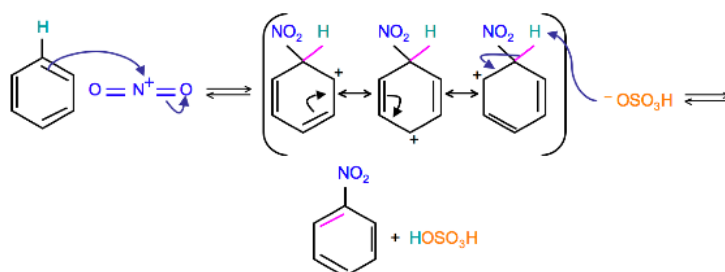
Sulfuric acid catalyzes the nitration of benzene. It is important to note the chemical formula for the nitrate group bonded to benzene is -NO₂. The chemical formula and name are assigned from an organic chemistry perspective which does not align with the inorganic perspective.



Step 1: Nitric acid (HNO₃) is protonated by sulfuric acid which causes the loss of a water molecule and formation of a nitronium ion, a strong electrophile.



Steps 2 and 3: Two pi electrons from benzene form a sigma bond with the nitronium ion to create the sigma complex. Bisulfate deprotonates the sigma complex to restore the aromatic ring as shown below.

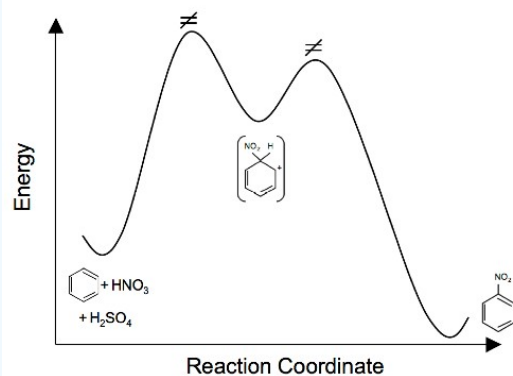


Exercise

6. Draw an energy diagram for the nitration of benzene. Draw the intermediates, starting materials, and products. Label the transition states.

Answer

6.



CONTRIBUTORS AND ATTRIBUTIONS

- Dr. Dietmar Kennepohl FCIC (Professor of Chemistry, [Athabasca University](#))
- Prof. Steven Farmer ([Sonoma State University](#))
- William Reusch, Professor Emeritus ([Michigan State U.](#)), [Virtual Textbook of Organic Chemistry](#)
- Catherine Nguyen

18.3: Nitration of Benzene (an EAS Reaction) is shared under a [not declared](#) license and was authored, remixed, and/or curated by LibreTexts.