

1. For the molecule boron trifluoride, BF_3 , predict its structure based on the hybridization of the boron atom. From the structure explain the observation that BF_3 has no molecular dipole

2. Draw the potential energy diagram for rotation around the C2-C3 bond of 2,2,3-trimethylbutane making sure to :
 - (i) draw the Newman projection for each distinct maximum and minimum
 - (ii) calculate the relative energies for all conformers

3. If the barrier to rotation around **C-C bond** of bromoethane is 3.6 kcal mol/mol calculate the value of a (C-H/C-Br) torsional interaction.

4. For the molecule 3-methyltetrahydropyran, **A** below
 - (i) draw the two chair conformations related by a ring flip
 - (ii) calculate, showing your method, the relative energies of each conformer

