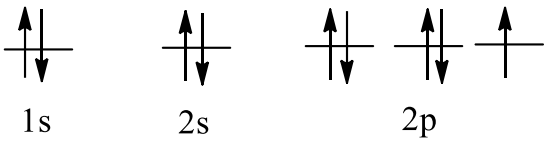
Answer on Question #53523 – Chemistry – General chemistry

Question:

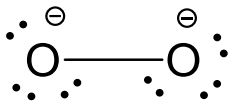
When oxidation state of oxygen is -1, what will be its orbital notation and how is it represented in a compound containing oxygen?

Answer:

Orbital notation for oxygen in oxidation state of -1 is:

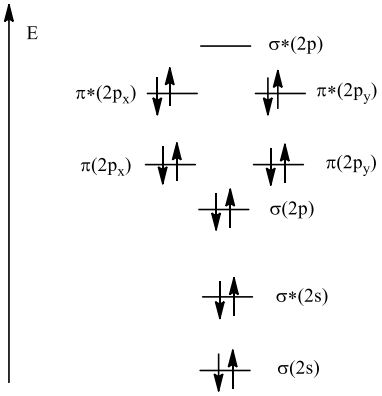


For instance, O_2^{2-} containing O^{-1} has the following Lewis structure:



It shows 3 lone pairs from 2s and 2p electronic shells. Two other electrons are paired to form bond between oxygen atoms.

Based on the Molecular orbital theory, two oxygen anions (O^{-1}) using the outermost 4 orbitals (one s and three p) form 8 molecular orbitals, which is represented in the diagram for O_2^{2-} :



O_2^{2-}

Bond order = (6 - 4)/2 = 1

Diamagnetic