

Answer on Question #54603 – Chemistry – General chemistry

Question:

Describe the structure of sulphuric acid and explain the reasons of shortening of S-O bonds in the molecule

Answer:

H₂SO₄ has tetrahedral structure which consists of two H-O bonds, two S-O (the distance is 157 pm) and two double bonds S=O (the distance is 149 pm).

The reason of shortening of S-O bonds is the partial formation of π - bond upon overlapping of empty 3d-orbital of sulfur and 2p-orbital of oxygen with a pair of electrons. However, this bond (S=O) is still very polar and only 10% of electron density found on π -bonding orbital. Therefore, S-O shortening is not significant (only by 8 pm) .