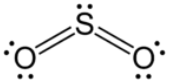
Answer on Question #44848 – Chemistry – Other

Question

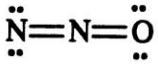
Which of the following species has a Lewis structure with a molecular geometry similar to SO_2?
Select one:
H_2S
NO_2 negative one
Cl_2CO
N_2O
NO_2

Answer

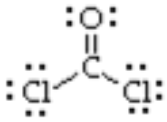
SO_2 has a Lewis structure with **bent** molecular geometry:



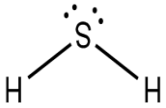
N_2O and Cl_2CO have Lewis structures with whole different molecular geometry, namely N_2O has **linear** molecular geometry:



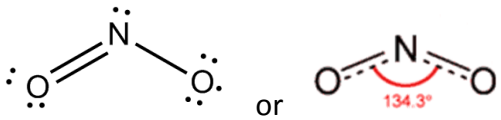
and Cl_2CO has **trigonal planar** molecular geometry:



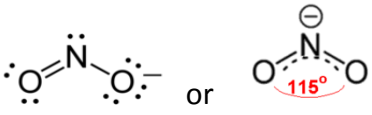
The rest tree species have Lewis structure with **bent** molecular geometry similar to SO_2, but H_2S has two lone pairs of electrons on the sulfur atom (tetrahedral electron pair geometr), and the repulsion forces of these lone pairs results in the angle H–S–H to be considerably less (92°) then the angle O = S = O in SO_2 (**119°**).



NO_2 has one lone pair on the central atom and bent molecular geometry similar to that of SO_2 but the angle O–N–O in NO_2 is greater (134°) than the angle of SO_2:



NO_2^- has the angle very close to that in SO_2 (**115°**):



So, **NO_2 negative one** has a Lewis structure with a molecular geometry most similar to SO_2.