

Exercises 8

Exercise 8.1

How many σ -bonds and how many π -bonds are there in (a) NO and (b) N₂O

Exercise 8.2

State the hybridization of the atom in boldface red type in each of the following molecules and ions: (a) SF₆; (b) ClO₃⁻; (c) NO₃⁻; (d) OCl₂

Exercise 8.3

Identify the hybrid orbitals used by the atom in boldface red type in each of the following molecules: (a) CH₃CCCH₃; (b) CH₃NNCH₃; (c) (CH₃)₂CC(CH₃)₂; (d) (CH₃)₂NN(CH₃)₂

Exercise 8.4

Identify the hybrid orbitals used by the atom in boldface red type in each of the following molecules: (a) H₂CCCH₂; (b) H₃CCH₃; (c) CH₃NNN; (d) CH₃COOH

Exercise 8.5

Propose one Lewis structure each for XeF₅⁺ and XeF₆ that makes use of ionic-covalent resonance to preserve the octet rule for each atom.

Exercise 8.6

Xenon forms XeO₃, XeO₄ and XeO₆⁴⁻, all of which are powerful oxidizing agents. Draw their Lewis structures and state their bond angles and the hybridization of the xenon atom. Which would be expected to have the longest Xe-O distances? Explain your answer.

Exercise 8.7

Describe the structure of the formamide molecule, HCONH₂, in terms of hybrid orbitals, bond angles and σ - and π - bonds. The C atom is bonded to one H atom, a terminal O atom and the N atom. The N atom is also bonded to two H atoms.