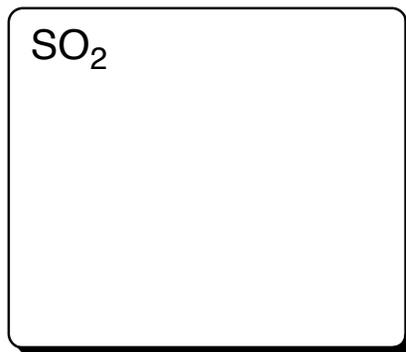
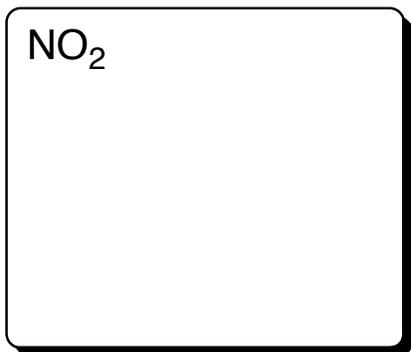
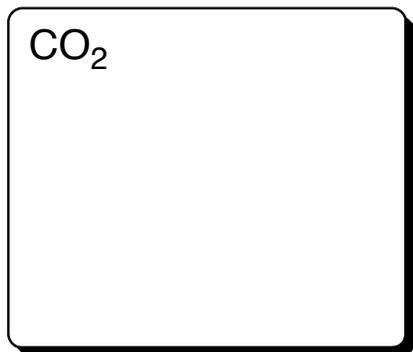
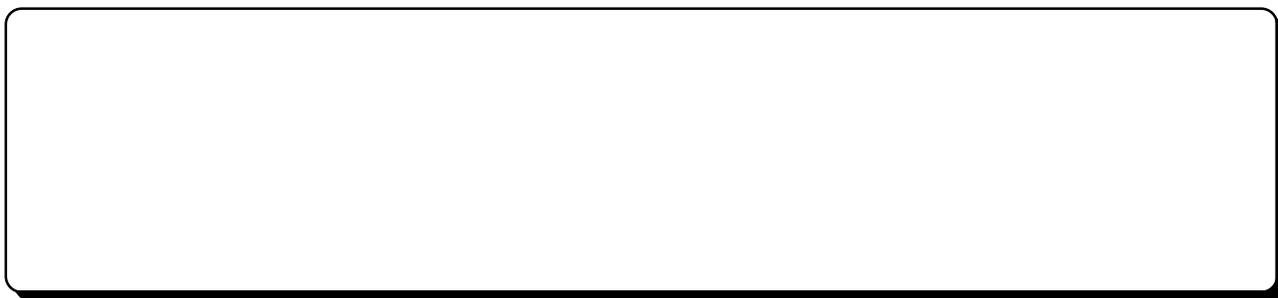


1. (a) In the boxes below, draw the structural formulae for the dioxides of carbon, nitrogen, and sulfur; in each case, the atom connectivity is O—X—O. Include all necessary bonds, lone pairs of electrons (or single unshared electrons if appropriate), and non-zero formal charges. (4 pts each)



(b) Which of these molecules has an O—X—O bond angle of 180°? Briefly explain your answer. (2 pts)



(c) Which of these molecules has the smallest O—X—O bond angle? Briefly explain your answer. (8 pts)



(d) One of these molecules is very reactive, and is observed to dimerize (two molecules join together) to form a new species with the formula X₂O₄. Which of the molecules above does this, what is the structural formula of the new species, and more importantly, why does this happen? (8 pts)

