1. Fill in the blanks to balance the following chemical reactions and then write the net reactions:

$$O_3 + Cl \rightarrow ClO +$$

 $ClO +$ $\rightarrow Cl + O_2$

Net:

$$O_3 + NO \rightarrow \underline{\hspace{1cm}} + O_2$$
$$\underline{\hspace{1cm}} + O \rightarrow NO + O_2$$

Net:

2. Describe how the reactions given below affect the ozone layer:

$$\begin{array}{c} ClO + NO_2 + M \Rightarrow ClONO_2 + M \\ ClONO_2 + sunlight \Rightarrow ClO + NO_2 \end{array}$$

3. Using the equations given in parts 1 and 2, add arrows and chemical names to complete the figure below.



Practice Problems

ATM S 212

4. Explain why the Antarctic ozone hole forms during southern hemisphere Spring. Incorporate the following reactions in your explanation:

$$HCl + ClONO_2 \xrightarrow{PSC \text{ ice surface}} Cl_2 + HNO_3$$

$$Cl_2 + sunlight \rightarrow Cl + Cl$$