Under daytime conditions the reactions that govern the concentration of HONO are 6-17 and 6-18. At night, however, the only apparent destruction route for HONO is reaction 6-14. Depending on the relative importance of reactions 6-18, 6-13, and 6-14 HONO may reach substantial concentrations under nighttime conditions. A lower limit on the nighttime concentration of HONO can be estimated from the equilibrium HONO concentration based on reactions 6-13 and 6-14.

$$[HONO] = \left(\frac{k_{13}[NO][NO_2][H_2O]}{k_{14}} \right)^{1/2} \qquad (6\text{-}48)$$

At $[NO] = [NO_2] = 0.1$ ppm, $[H_2O] = 2.4 \times 10^4$ ppm (50 percent relative humidity), the equilibrium HONO concentration calculated from equation 6-48 is 1.9×10^{-2} ppm.

Like HONO, HO_2NO_2 and RONO, PAN undergoes both formation and decomposition steps (reactions 6-42a,b). Unlike these former species, however, the balance between the formation and decomposition reactions is such that PAN may achieve appreciable concentration levels relative to those of NO and NO_2. Because the decomposition reaction for PAN is strongly temperature dependent, the steady state PAN concentration is highly dependent on the temperature. As temperature increases the role of PAN as an NO_2 sink decreases markedly; at low temperatures, on the other hand, steady state PAN concentra-