The photochemistry of trifluoronitromethane adsorbed on sublimated alkali halide films was investigated using infrared spectroscopy. Spectra were acquired of CF$_3$NO$_2$ adsorbed onto films of potassium chloride, potassium bromide, and sodium bromide at 80 K and high vacuum conditions. Vibrational frequencies of the adsorbate were compared to gas phase values and the differences noted. Photolysis of the sample at 12 K with a hydrogen lamp produced the decomposition product CF$_2$O, identified by spectral analysis. Desorption data were collected as the temperature was incrementally raised, and rate constants calculated for each temperature. Frequencies monitored for CF$_3$NO$_2$ were 1604 cm$^{-1}$, 865 cm$^{-1}$, and 747 cm$^{-1}$. Frequencies for CF$_2$O were 1908 cm$^{-1}$ and 1942 cm$^{-1}$. Energies of adsorption were calculated for both compounds.