PRIMARY QUANTUM YIELDS FROM PEROXYACETYL NITRATE PHOTOLYSIS

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Peroxyacetyl nitrate (PAN) is the main reactive nitrogen reservoir specie in the Arctic throughout the winter to spring transition. Low temperatures in the Arctic preclude thermolysis of PAN as a mechanism through which NO_2 is released from the PAN reservoir. Photolysis quantum yields for PAN between 290-320nm are thus important to understand the processing of PAN reservoir in the Arctic spring. We have measured the nitrate radical quantum yield over this range of photolysis energies using cavity ring-down spectroscopy to detect NO_3. Photolysis of PAN below 248nm produces only NO_2 and NO_3, thus we are able to derive quantum yields for both channel that are significant in the atmosphere. *Ab initio* calculations were performed to provide insight into the competition between the dissociative excited states involved in PAN photolysis.