

Summertime PAN on boundary layer over the Northern Pacific Ocean

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As a part of SHIPPO (Shipborne Pole to Pole Observation), peroxyacetyl nitrate (PAN) and NO_2 have been measured at aboard the R/V Araon during the ship track from Incheon, South Korea to Norm, Alaska, USA from July 14th to 30th, 2012. PAN and NO_2 were sampled every 2 minute by a fast chromatograph with luminol-based chemiluminescence detection. In order to assure their detections in remote background airs, we successfully reduced random noise mainly from PMT using ensemble averaging from the 2 min chromatograms in each one hour time interval. With this post-processing analysis, we were able to lower detection limits to 0.01 ppbv and 0.04 ppbv for PAN and NO_2 , respectively. The preliminary results indicate that the background values ranged from the below the detection limit to 0.37 ppbv (average of 0.06 ppbv) for PAN and 2.05 ppbv (average of 0.24 ppbv) for NO_2 . It was confirmed that PAN was significant portions of reactive nitrogens in remote marine boundary airs. Occasional enhancements of PAN and NO_2 were mainly attributed to the air masses originated from nearby source regions in the Northeastern Asia and influenced by ships exhausts. We were able to observe the shifting of equilibrium between PAN and NO_2 according to air temperature changes in very clean air masses.