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Chemical characteristics of precipitation observed in korea peninsula

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We have observed and analyzed the precipitation in four stations, Anmyeondo (Western part of Korea, 36.53N, 126.32E) Gosan (Southern Part, 33.30N, 126.21E), Uljin (Eastern Part, 36.98N, 129.42E), and Ulleungdo (Eastern Part, 37.48N, 130.90E) since 1997. Korea is not only located in downwind area from Asia Continental but also is characterized with seasonal wind direction. In this study, we analyzed the seasonal precipitation data obtained in the four stations from 2001 to 2012 with pH, Electric conductivity, and soluble ions such as F-, Cl-, NO_3-, SO42-, Na+, NH4+, K+, Mg2+, and Ca2+. The precipitation samples were collected during 24 hours and then analyzed cat-ions and an-ions using IC (Ion chromatography, ICS2000 DIONEX) after filtering to remove the aerosols. Their QA/QC are made with ion balance and conductivity balance as following GAW report (No. 160, 2004). The average weighted with precipitation amounts for pH and soluble ions of the period from 2001 to 2012 was calculated. For pH, it showed the high value in order of Uljin (4.88) > Gosan (4.84) > Ulleng-do (4.83) > Anmyendo (4.68) indicating western part of Korea had the lowest value during the period from 2001 to 2012. The mean concentrations of the secondary pollutants, such as NO_3-, nss-SO42-, and NH4+ were the highest value in Anmyeondo as indicating 32.0 μeq L-1, 47.6 μeq L-1, and 35.1 μeq L-1 respectively while those of species in Uljin were the lowest as showing 17.9 μeq L-1, 7.9 μeq L-1, and 16.2 μeq L-1 respectively during the same period. For potassium which is derived from the biomass burning, it was the highest concentration in Ullengdo, eastern part of Korea, indicating it was 10 times higher than other three stations. All four stations showed the decrease of pH during the period and lowest value in winter (December to February) out of four seasons.