



Hydrogeochemistry and isotope geochemistry of the upper North Han River, Korea

Y. Park (1, 2), J.-Y. Yu (1) and K. S. Lee (2)

(1) Dept. Geology, Kangwon Nat'l Univ., Chuncheon, Kangwon-Do, Korea

(2) Korea Basic Science Institute, Daejeon, Korea

(pyy@kbsi.re.kr / Fax: +82-42-865-3963)

The Han River is the largest river in South Korea and consists of two major tributaries : the North and South Han Rivers. The North Han River basin mostly consists of Pre-cambrian gneiss basements and Mesozoic granites. In order to investigate the seasonal and spatial variations of major elements and stable isotopes of oxygen, hydrogen and sulfur in the upper North Han River, river waters were monthly sampled during a two-year period from July 2002 to April 2004. For comparison, precipitations from discrete individual events were collected for the same period. The pH values of the river waters have a range from near neutral to alkaline (5.73-9.04 with an average of 6.81), whereas those of precipitation have a range from highly acidic to neutral (2.59-7.21 with an average of 5.09). The electrical conductivities of the rivers (28.4-509 $\mu\text{S}/\text{cm}$ with an average of 127.6 $\mu\text{S}/\text{cm}$) are much higher than those of precipitation (1.60-157 $\mu\text{S}/\text{cm}$ with average of 34.4 $\mu\text{S}/\text{cm}$), indicating moderated water rock interaction with granitic basements.

The chemical compositions of the river waters display little seasonal and spatial variation. The water chemistry appears to be mainly influenced by contribution of precipitation and local lithology. The oxygen and hydrogen isotopic data of precipitations shows much larger scatter than those of river waters. River waters plot around local meteoric water line, indicating of meteoric origin.

The isotopic compositions of rivers and precipitations display a weak seasonal variation. The average values of hydrogen, oxygen and sulfur isotopic compositions of the river waters are very similar with those of precipitations, indicating that the iso-

topic compositions of the surface waters in the Chuncheon area have been directly influenced by local precipitation.