

Present States of Uranium and Radon in Groundwater in Chungwon, Korea Abstract n°2140

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Uranium and radon concentration was assessed in groundwater samples collected from 47 private and public wells covering three hydrogeological units which is Jurassic biotite granite(Jbgr), Pre-Cambrian biotite gneiss(PCbgn) and Sedimentary rocks(Sedi). Water samples have been collected from 31 wells in Jbgr, 24 wells in PCbgn and 3 wells in Sedi. Major ion concentrations and physico-chemical parameters were also measured. These results have given the basis for an attempt to characterize the groundwaters of research area with respect to uranium and radon content. Concentration values ranged from 0.06 to 178 $\mu\text{g L}^{-1}$ for ^{238}U and from 80 to 12,900 pCi L^{-1} for ^{222}Rn . The statistical analysis for ^{238}U and ^{222}Rn showed a log-normal distribution with a mean of 6.60 $\mu\text{g L}^{-1}$ and 2,006 pCi L^{-1} , and a median of 0.80 $\mu\text{g L}^{-1}$ and 1,250 pCi L^{-1} , respectively. Uranium concentrations were almost lower than maximum contaminant level for drinking water in U.S EPA. One of 47 groundwater samples had levels of uranium that exceeded the maximum contaminant level for drinking water. About 6% of the samples in ^{222}Rn concentrations exceeded 4,000 pCi L^{-1} of US EPA's Alternative MCL (AMCL) and 8,100 pCi L^{-1} of Finland's guideline level, respectively. A hydrogeological study revealed correlations between the concentration of radionuclides and the aquifer material's characteristics. Higher uranium and radon concentrations in groundwater are related to the granitic rocks. The correlation analysis between uranium and radon and other variables only a weak relationship between uranium and pH value (correlation coefficient 0.37 in uranium and radon, respectively). None of major ion concentrations showed a significant statistical correlation with uranium and radon. Uranium and radon concentrations in the groundwater is relatively low compared with other countries having similar geological conditions possibly due to the inflow of shallow groundwater to the wells.

