# Distribution of radioactive uranium and radon in sedimentary environments

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Generally, the concentration of uranium in clastic rocks is only several ppm but can be as high as $n\times10^3$ppm～$n\times10^4$ppm in some particular areas. In order to understand the distribution characteristics of uranium and radon in different sedimentary environments, 69 core samples collected from the Quaternary, Cretaceous and Jurassic deposits with the depth from 7.1m to 1319m were analyzed for the uranium, mercury, organic carbon, secondary carbonate and gaseous hydrocarbon composition. Uranium was extracted with the ammonium salt mixed solution ($NH_3F$+$NH_4Ac$) so as to obtain the uranium concentration related with hypergenesis. The analytic data showed that the average concentration is 0.16ppm for uranium, 0.58Bq/kg for radon, 36.9ppb for Hg, 0.90% for organic carbon, 1.96% for secondary carbonate ($CO_2$), 890.8μl/kg for $CH_4$ and 153.4μl/kg for gaseous heavy hydrocarbons.

The study showed that in the Quaternary loess the uranium content has an obvious positive correlation with the organic carbon and secondary carbonate contents but a negative correlation with the mercury and methane contents. In the Cretaceous and Jurassic deposits composed mainly of sandstone and mudstone, the uranium content has no correlation with the organic carbon, secondary carbonate and mercury contents, however, a slightly negative correlation exists between the uranium content and methane content.

Therefore, to further investigate the existing state, migration, dispersal and enrichment mechanism of uranium in different sedimentary environments is of significance both in theory and in practice for exploring sedimentary uranium ore resources, disposing and storing radioactive nuclear waste.

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