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Estimation of the environmentally affected parameters of coal combustion residuals containing NORM to be used as backfill material –Case study in Vietnam

The reuse of the coal ash from thermal power plants as the backfill material in Vietnam has been encouraged by the government (Decision 452/QD-TTg signed on 12 April 2017). It is the one of several solutions to manage the industrial waste containing naturally occurring radioactive materials (NORM) in our country.
The distribution of naturally occurring radioactive materials (NORM) in coal combustion residuals from different coal sources and different burning regime of power stations was studied. Among the inorganic constituents presented in coals and later enriched in the combustion residuals, the specific radioactivity of coal ash caused by naturally radioactive nuclides such as 238U, 232Th, 226Ra, 40K was considered to be important parameters, which might affect the environment when the coal ash was applied as a backfill material in the construction sites. The estimation of radionuclide concentration of NORM in coal combustion residuals together with the heavy elements in the leaching solutions under the conditions at laboratory and at backfill sites were carried out. The analytical methods consisting of gamma spectrometry with HpGe detector and the inductively coupled plasma mass spectrometry (ICP-MS) were applied in the laboratory but the Rn measurement on site was done by RAD7 instrument. The Vietnamese national standard (TCVN 12249:2018) on the use of the coal ash from thermal power stations to backfill in construction sites was thus issued by the ministry of science and technology.

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