

Original

Dry Classification of Radioactive Cesium Contaminated Soil by Magnetic Selection Using Blast Furnace Slag Fine Powder

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Summary

Finer soil particles tend to be associated with greater contamination concentration by radioactive cesium. Classification treatment, which means separating fine-grained contaminated soil from coarse grained soil satisfying reference values, allows reuse of coarse-grained soil. Wet classification with water has been conducted for contaminated soil. However, cohesion precipitation processing of the turbid water generated by wet classification becomes difficult as the particle sizes of the fine particles become smaller. As the properties of the turbid water change, cohesion precipitation processing becomes unstable. Using simulated cesium contaminated soil, we explored a dry classification testing method that does not produce any wastewater. Using ground granulated blast-furnace slag as a magnetic material, after magnetic separation using two-step lattice type magnet, We found that about 20 wt% of the sample was classified as magnetized fine fraction which had more cesium concentration by about 2.7 times than the sample without the classification treatment. Subsequent tests assessed radioactive cesium contaminated soil using a drum-type magnetic separator to separate fine and coarse fractions. The results indicated the radioactive cesium concentration in the coarse fraction samples had dropped by between 39% and 46%. The number of execution processes of dry classification was comparatively less than wet classification, so the flow of classification processes of contaminated soil at fields can be simplified.

Key Words: Radioactive cesium contaminated soil, Ground granulated blast-furnace slag, Dry classification, Magnetic sorting, Drum-type magnetic separator
