Study on the utilization of the manufacturing technology of the high quality melting slag		
Whole term	1994. 10 ~ 1997.3	

(Purpose)

Considering the fact that the possibility of obtaining landfill sites annually can not be guaranteed, sludge reduction by incineration alone is not sufficient. The effective use of wastewater sludge is an urgent task in the environmental view point.

Application of sludge utilization as a public project is a way of using it effectively. The demand for building materials may increase too. Especially, as the supply of broken stones and aggregates has been decreasing in the metropolitan area, this usage has a bright prosperity. In addition, the utilization of the seashore-sand was investigated because there is a long seashore in Kanagawa. Hence, an innovative technology to manufacture melting slag for wide usage is necessary.

This study focused on the establishment of a manufacturing technology that manages the melting temperature of the incinerated ash of sewage sludge and promotes the crystallization by slow cooling in a warm conveyor, consequently produces a high quality slag.

(Results)

1) Test on melting incinerated coal and slag

(1)A melting facility sourced by paraffin oil could melt the incinerated ash of three plants stably.

(2)In the preliminary test by the warm conveyor of a reheated burner, a melting slug was heat-treated at optimal temperature patterns such as 700 ° C for 1hour and 900 ° C for 1 hour. Then a slag with a crystal of calcium phosphate was produced at a high-rate. The produced crystallized slag possessed the proper conditions for usage as aggregates and reinforcements.

(3) It was confirmed that the slag could be utilized though the slag was slowly cooled in one direction in the warm conveyor. Therefore, it is clear that an energy reduction is possible according to operational conditions and the energy demand.

(4) A basic investigation of the real facility was done based on the results of the operation of a real scale plant.

(5)In several plants, the crystallization of ash was so hard that an isolated treatment was difficult. This ash should be mixed with others as per the amount permitted in the other plant.

2) Tests on various products manufactured using the high quality slag

(1)Reinforcement: Crystallized slag product crushed for the target of RC-40, satisfied the standard of the construction test and the leaching test. Further, the applicability of reinforcement was verified in the pavement test.

(2)Concrete aggregate: Because it has 90% performance (pressure strength) of a natural stone, it can be sufficiently used according to the objective of usage.

(3)Permeable interlocked block: A block with a mixed ratio of 50% (volume) can be made to satisfy the permeability test and standard of the strength.

(4)Sand: Circular sand can be obtained from sand generators. As per the results of the leaching test, sand can be used without toxic materials.

3) Investigation on the distribution method

The demand for the aggregates, according to the investigation in Kanagawa Prefecture, is very huge. And they can be used as sand in the seashore.

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