
Production of recycled fine aggregate by underwater pulse power discharge

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In recent years, industrial waste has increased due to mass production and mass consumption in Japan. Among industrial waste, the construction industry accounts for 20%. Waste concrete accounts for the largest proportion of construction waste. And it is expected that exhaust of waste concrete will continue to increase in the future. In addition, much concrete aggregates are necessary to construct the new and renewal buildings. However, natural aggregates can no longer be taken by newly harvesting due to depletion of natural resources and regulations of the environmental conservation law. Therefore, new methods must be developed that can reuse disposal concrete and produce fine aggregate.

In this work, the pulsed power discharges inside of waste concrete immersed in water were used to reproduce the fine aggregate. In the experiment, Marx generator which accumulates energy of 20 kJ / pulse was used as a pulse power source, and the point-to-mesh electrode was immersed in water. In this study, the dependences of the quality of the recycled fine aggregate on the consumption energy and electrode gap distance were investigated. As the results, the best condition of the discharge parameter is found. During the experiments, the recycled fine aggregate was evaluated under the JIS (Japanese Industrial Standards) standard.