



pH neutralization of the by-product sludge waste water generated from waste concrete recycling process using the carbon mineralization

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About 44 Mt/year of waste concrete is generated in South Korea. More than 95% of this waste concrete is recycled. In the process of regenerating and recycling pulmonary concrete, sludge mixed with fine powder generated during repeated pulverization process and water used for washing the surface and water used for impurity separation occurs. In this way, the solid matter contained in the sludge as a by-product is about 40% of the waste concrete that was input. Due to the cement component embedded in the concrete, the sludge supernatant is very strong alkaline (pH about 12). And it is necessary to neutralization for comply with environmental standards. In this study, carbon mineralization method was applied as a method to neutralize the pH of highly alkaline waste water to under pH 8.5, which is the water quality standard of discharged water. CO₂ gas (purity 99%, flow rate 10ml/min.) was injected and reacted with the waste water (Ca concentration about 750mg/L) from which solid matter was removed. As a result of the experiment, the pH converged to about 6.5 within 50 minutes of reaction. The precipitate showed high whiteness. XRD and SEM analysis showed that it was high purity CaCO₃. For the application to industry, it is needed further study using lower concentration CO₂ gas (about 14%) which generated from power plant.