

Performance of cross-linked plastics as aggregates for cement composites through gamma-ray irradiation

*Hyeon-Wook Cheon¹⁾, Heon-Seok Lee²⁾, Jamshid Ruziev³⁾ and Woosuk Kim⁴⁾

1), 2), 3), 4) Department of Architectural Engineering, Kumoh National Institute of Technology, Gumi 39177, Korea

4) kimw@kumoh.ac.kr

ABSTRACT

Recently, as enlarged and super-high-rise construction structures have been increased, the demand for high strength and lightness of construction members is also increasing. According to previous research, it was found that the strength of the cement composites decreased due to the reduction of the unit volume weight of the lightweight cement composites. In order to induce the lightness of cement composites, the lightness of aggregates could be induced as a solution. And research is being actively conducted on how to use lightweight aggregates such as rubber lightweight aggregates and plastic lightweight aggregates. Among them, plastic aggregates are preferable in the production of lightweight cement composites due to their relatively high strength and low unit volume mass. However, the surface properties of plastic aggregates are unfavorable for adhesion between aggregates and cement pastes. In this study, plastic pellets, induced and altered bridge phenomenon using gamma ray irradiation technology, are mixed to cement complexes to test unit volume weight, compressive strength, and flexural strength of cement composites.

REFERENCES

- C. Schaefer "Irradiated Recycled Plastic as a Concrete Additive for Improved Chemo-mechanical Properties in Hardened Cement Pastes" (2017), Department of Nuclear Science and Engineering at the Massachusetts Institute of Technology

¹⁾ Master's Student

²⁾ Ph. D. Candidate

³⁾ Master's Student

⁴⁾ Associate Professor