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- Modelling the strength of cashew nutshell ash-cement-based concrete

Modelling the strength of cashew nutshell ash-cement-based concrete

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Abstract

This study models the flexural strength of concrete modified with cashew nutshell ash (CNA) using reactivity index concepts. Cashew nutshell was valorised and its ash was used at 5, 10, 15 and 20 wt.% of cement via mix proportions of concrete grades C 25–40 targeted at 25–40 MPa at 28 days. The reactivity indexes (RIs) were evaluated based on the oxide compositions and chemical moduli of both the cement and CNA. The design mix parameters, water/binder and binder/aggregate ratios, and RIs were applied to model the flexural strength at 7–90 days' curing. The results revealed that, at 28 and 90 days' curing, the developed models yielded high precisions at 91 and 84% R^2 , respectively, hence indicating a good agreement. Moreover, there was a good relationship between these developed models and previous studies. Therefore, the flexural strength of concrete incorporating supplementary cementitious materials (SCMs) can be efficiently predicted via these developed models; this would save both time and money when carrying out the experimental works.

Keywords: [cement/cementitious materials](#) [compressive strength](#) [modelling](#)

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