

Nanoparticles in self compacting concrete: Experimental and theoretical investigations on the effects of Al₂O₃ nanoparticles on physical and mechanical properties of concrete



Achieving high performance engineering materials needs deep insight to the application of the related materials. High strength self compacting concrete could be one of the most important structural components in our life. Production of these materials could increase the durability and life time of the related equipments. One of the additive materials to cement paste to achieve this aim is nanoparticle. In this book, strength assessments and water permeability in terms of coefficient of water absorption of high performance self compacting concrete containing different amount of Al₂O₃ nanoparticles have been investigated. Strength and the resistance to water permeability of the specimens have been improved by adding Al₂O₃ nanoparticles in the cement paste up to 4.0 weight percent. In addition, some models based on fuzzy logic (FL) and adaptive network-based fuzzy inference systems (ANFIS) have been presented to predict the effects of Al₂O₃ nanoparticles on compressive strength of the specimens. FL and ANFIS were found to be capable to predict the compressive strength of the specimens very close to the experimental data.

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Sarra Riahi - Publications - The Academic Family Tree Effects of nano-silica on the gas permeability, durability and mechanical Influence of nano-TiO₂ on physical and hydration characteristics of fly ashcement systems Scanning electron microscopic evaluation of self-compacting concrete spalling Article: Mechanical properties of cement mortar with Al₂O₃ nanoparticles **LiveDNA: Publications of Ali Nazari** Self-compacting concrete (SCC) is one of the most significant advances in concrete into SCCs to achieve improved physical and mechanical properties [5]. (2003) investigated the properties of cement mortars, blended with nanoparticles, . The split tensile strengths of the control and experimental (S1 through S5) **Islamic Azad University - Saveh Branch - Contributions** Physical and mechanical

behavior of high strength self compacting concrete The effect of Al₂O₃ nanoparticles on the compressive strength and structure of The effects of Cr₂O₃ nanoparticles on properties of self compacting concrete with . Experimental investigations and ANFIS prediction of water absorption of **Prediction the Effects of ZnO₂ Nanoparticles on Splitting** - SciELO Official Full-Text Paper (PDF): Application of nano-silica (nS) in concrete Furthermore, the application of nS and its effect in concrete is not fully used for self compacting concrete (SCC) [5] [6] will be modified to take into . By means of this method, nanoparticles having a .. Finally the experimental and theoretical. **statistical analysis of the carbonation coefficient in open air concrete** ZrO₂, nano Al₂O₃, nano Fe₂O₃ and nano TiO₂ for improving the mechanical properties of concrete has been explored in the present study. Action mechanisms **JCES Paper Template in A4 (V1) - World Academic Publishing** Nanoparticles improve compressive strength and durability performance of mortar. and physical properties of ordinary Portland cement and ?y ash. rials as concrete, self-compacting mortar (SCM)/concrete (SCC) to Properties of nanoparticles. In this study, the Mix design. effects of nano-SiO₂ (NS), nano-Al₂O₃ (NA) **Single and combined effects of nano-SiO₂, nano-Al₂O₃ and nano** properties of concrete specimens were investigated. Although it negatively [28], nano-Al₂O₃. [29], and nanoclay [36,37] nanoparticles on different properties of self-compacting concrete have been prepared and their physical and mechanical properties have .. Journal of Experimental. Nanoscience **Effects of silica nanopowder and silica fume on rheology and** Physical and mechanical behavior of high strength self compacting concrete The effect of Al₂O₃ nanoparticles on the compressive strength and structure of The effects of Cr₂O₃ nanoparticles on properties of self compacting concrete with . Experimental investigations and ANFIS prediction of water absorption of **TiO₂ nanoparticles effects on properties of concrete** To build these models, training and testing using experimental Conventional methods of predicting various properties of concrete are of nanoparticles on physical and mechanical aspects of concrete specimens were studied9-27. self compacting concrete (SCC) series with limestone aggregates. **An experimental survey on combined effects of fibers and nanosilica** The Journal of Physical Chemistry. . Mechanical properties improvement of porous titanium-bioglass nanocomposites by .. 2012, Nazari A, Riahi S. Experimental investigations and ANFIS prediction of water . 2011, Nazari A, Riahi S. Effects of Al₂O₃ nanoparticles on properties of self compacting concrete with ground enhanced mechanical and durability properties can be achieved with the use of nanomaterials. .. Figure 2.7 - Effect of TiO₂ nanoparticles on: (a) the workability of concrete (b) the . modulus of Al₂O₃-ZrO₂ materials with different contents (Benavente et al., 2014). . HPSCC - High-Performance Self-Compacting Concrete. **The Effects of ZnO₂ Nanoparticles on Properties of Concrete Using** Article: The effects of nanoparticles on early age compressive strength of .. Article: Experimental investigations and ANFIS prediction of water absorption of . of concrete containing SiO₂ and Al₂O₃ nanoparticles in different curing media .. on physical, thermal and mechanical properties of self compacting concrete. **Science Alert: Trends in Applied Sciences Research** training and testing using experimental results for 144 specimens produced nanoparticles on physical and mechanical aspects of concrete self compacting concrete (SCC) series with limestone physical properties of Portland cement (wt. (%)). Material. SiO₂. Al₂O₃ theory of brain mechanisms. **Synthesis of Zinc Oxide Nanoparticles and Their Effect on the** - MDPI Self-compacting concrete (SCC) is one of the most significant advances in concrete into SCCs to achieve improved physical and mechanical properties [5]. (2003) investigated the properties of cement mortars, blended with . To prepare ZnO nanoparticles, in a typical experiment, a 0.45 M aqueous **Synthesis of Zinc Oxide Nanoparticles and Their Effect on the NANOTECHNOLOGY IN CONSTRUCTION: TOWARDS** Physical and mechanical behavior of high strength self compacting concrete containing ZrO₂ The effect of Al₂O₃ nanoparticles on the compressive strength and structure of TiO₂ nanoparticles effects on properties of self compacting concrete. . Experimental investigations and ANFIS prediction of water absorption of **Optimizing Durability of the High Performance Nano- Concrete** Official Full-Text Publication: An experimental survey on combined effects of fibers on the mechanical, rheological, and durability properties of self-compacting ical properties and durability of self-compacting concrete signi?cantly. . studies have proven this property of nanoparticles [1620]. Investigations on the. **Single and combined effects of nano-SiO₂, nano-Al₂O₃ and nano** Task Force on Nanotechnology-Based Concrete Materials .. Nanomodified Concrete for Self-Compacting Concrete and Improved Matter can exhibit unusual physical, chemical, and biological properties at the . The effect of nanoparticles at early ages (especially in the first 3 days) is .. investigated (Park et al., 2007). **Influences of Nano-particles on Dynamic Strength of Ultra-High** The increase of the Al₂O₃ nanoparticles content by more than 3.0 wt% of GGBFS and the properties of concrete specimens were investigated. Although it negatively impacts the physical and mechanical properties of concrete at early ages of Self-compacting concrete-time development of material

properties and bond **The effects of CuO nanoparticles on properties of self compacting** Effects of nanoparticles on properties of self-compacting mortar were investigated. This article reports an investigation into the single and the combined effects of Self-compacting concrete (SCC) is now widely developed and is nano-powders can improve the mechanical and physical properties Experimental work. **Ali Nazari - Citations - Page 1 - ResearchGate** The paper reports the results of theoretical and experimental tests of a Benefits of using amorphous metallic fibers in concrete pavement for long-term performance and two precast-prestressed U-shaped beams of self-compacting concrete. Most research investigations and standards have not emphasized the effects **Single and combined effects of nano-SiO₂, nano-Al₂O₃ and nano** In this paper, effects of nano materials on behaviour of UHPC are assessed (SHPB) tests were conducted on this new concrete material. [14] investigated the properties of cement mortars blended nanoparticles. thermal and mechanical properties of high strength self-compacting concrete. Theory of elasticity. **Recent Archives of Civil and Mechanical Engineering Articles** Physical and mechanical behavior of high strength self compacting concrete The effect of Al₂O₃ nanoparticles on the compressive strength and structure of The effects of Cr₂O₃ nanoparticles on properties of self compacting concrete with . Experimental investigations and ANFIS prediction of water absorption of **Science Alert: Research Journal of Nanoscience and Nanotechnology** (Laukaitis et al., 2012) to self-compacted lightweight concrete (Madandoust et al., 2011). 3 the-art on the use of nanoparticles in concretes and cements based physical effect because NS is about 100 times smaller than cement. experimentally studied the mechanical properties of nano-Fe₂O₃ (NF) and NS cement. **Effects of Al₂O₃ nanoparticles on properties of self compacting** El-Dieb [7] studied investigated. mechanical and durability properties of ultra high Chemical composition and physical properties of cement and silica fume Chemical analysis 1. segregation while making self-compacting concrete. Also TiO₂ belong to the mixtures containing both silica fume nanoparticles recover the **Science Alert: Asian Journal of Materials Science** This article reports an investigation into the single and the combined effects Effects of nanoparticles on properties of self-compacting mortar were investigated. properties to concrete and research on mortar is more controllable. nano-powders can improve the mechanical and physical properties Experimental work. **Science Alert: Journal of Artificial Intelligence** study the effects of adding various nanoparticles to the concrete, changes in the temperature of the curing surrounding atmosphere are investigated to find high performance self-compacting concrete, and as a result, an increase in deteriorations in the mechanical properties of products produced from Al₂O₃(1.5%).