

Discovery

About the Cover



ABOUT THE COVER

The quantity of water present in the concrete matrix controls many fresh and hardened properties of concrete such as workability, compressive strengths, permeability and water tightness, durability and weathering, drying shrinkage and potential for cracking. Thus the limiting and controlling the amount of water present in concrete matrix as well as cement paste is important for both constructability and an extension service life of concrete infrastructures. The successful key for making durable concrete is to limit its ability to transport fluids like water. In order to devise realistic testing methods, that determine the ability of concrete to withstand water penetration requires an understanding of water mobility. In order to build durable oriented and practicable concrete structures, it is needed to be able to accurately predict the water sorptivity, water de-sorption, relationship between water sorptivity-de-sorptivity, water diffusion coefficient-sorptivity, water diffusion coefficient-moisture content, and moisture content-time duration within the concrete structures. Therefore, there is a need to quantify the sorptivity-de-sorptivity coefficient in concrete cubes which is of the most important factor in the concrete industries. The present research work is made an attempt to interpret the concrete sorptivity-de-sorptivity coefficient in ordered to characterize the different concrete mixtures design for in case of concrete cubes. Thus the objectives of this present research are such as: this research will examine the influence of concrete ingredients on the results of water sorptivity-de-sorptivity performed on concrete cubes with different mixtures proportion in which slump, and w/c ratio value is varied with constant compressive strength as in the First case and compressive strength, and w/c ratio value varied with constant slump as in the Second case. Seventy-two concrete cubes (100 mm^3) with Grades of concrete ranges from 25 to 40 N/mm^2 were prepared and evaluate the water sorptivity effect in designed different mixtures type. As from this research work that, it's possible to establish power type of equation between de-sorptivity coefficient and square root of time in designed mixtures type. (Ref: Balakrishna MN, Fouad Mohamad, Robert Evans, Rahman MM. Characterization of concrete cubes by Sorptivity-de-sorptivity test. *Discovery*, 2018, 54(274), 368-376).

Characterization of concrete cubes by Sorptivity-de-sorptivity test

Balakrishna MN, Fouad Mohamad, Robert Evans, Rahman MM

The quantity of water present in the concrete matrix controls many fresh and hardened properties of concrete such as workability, compressive strengths, permeability and water tightness, durability and weathering, drying shrinkage and potential for cracking. Thus the limiting and controlling the amount of water present in concrete matrix as well as cement paste is important for both constructability and an extension service life of concrete infrastructures. The successful key for making durable concrete is to limit its ability to transport fluids like water. In order to devise realistic testing methods, that determine the ability of concrete to withstand water penetration requires an understanding of water mobility. In order to build durable oriented and practicable concrete structures, it is needed to be able to accurately predict the water sorptivity, water de-sorption, relationship between water sorptivity-de-sorptivity, water diffusion coefficient-sorptivity, water diffusion coefficient-moisture content, and moisture content-time duration within the concrete structures. Therefore, there is a need to quantify the sorptivity-de-sorptivity coefficient in concrete cubes which is of the most important factor in the concrete industries. The present research work is made an attempt to interpret the concrete sorptivity-de-sorptivity coefficient in ordered to characterize the different concrete mixtures design for in case of concrete cubes. Thus the objectives of this present research are such as: this research will examine the influence of concrete ingredients on the results of water sorptivity-de-sorptivity performed on concrete cubes with different mixtures proportion in which slump, and w/c ratio value is varied with constant compressive strength as in the First case and compressive strength, and w/c ratio value varied with constant slump as in the Second case. Seventy-two concrete cubes (100 mm^3) with Grades of concrete ranges from 25 to 40 N/mm² were prepared and evaluate the water sorptivity effect in designed different mixtures type. As from this research work that, it's possible to establish power type of equation between de-sorptivity coefficient and square root of time in designed mixtures type. The de-sorptivity coefficient is predominantly increased at an initial stage as when compared to longer time duration for in case of all mixtures type. It's also confirmed from the results that, the de-sorptivity coefficient is significantly decreased for in case of higher compressive strength and varied slump. But in the case of lower compressive strength and constant slump, the variation of de-sorptivity coefficient with square root of time is slightly higher and goes on decreases with increased compressive strength for in case of designed mixtures type. It's possible to establish polynomial type of equation between sorptivity-de-sorptivity coefficient ratio and square root of time in designed mixtures type. The sorptivity-de-sorptivity coefficient ratio is predominantly decreased at an initial stage as when compared to longer time duration for in case of all mixtures type. It's also confirmed from the results that, the sorptivity-de-sorptivity coefficient ratio is significantly decreased for in case of higher compressive strength and varied slump. But in the case of lower compressive strength and constant slump, the variation of sorptivity-de-sorptivity coefficient ratio with square root of time is slightly higher and goes on decreases with increased compressive strength for in case of designed mixtures type. From this research work that, it's possible to establish polynomial type of equation between water diffusion coefficient and moisture content with constant higher concrete compressive strength and varied slump value for in case of designed mixtures type. Finally, from this research work that, it's possible to establish power type of equation between water diffusion coefficient and moisture content with varied compressive strength and constant slump value for in case of designed mixtures type. The water diffusion coefficient is increased at an initial stage with lesser moisture content for in case of lower compressive strength and constant slump value and goes on reduced with pre-dominantly increased moisture content. But it's also confirmed from the results that, the water diffusion coefficient is slightly decreased at initial stage with lesser moisture content and goes on reduced with lower moisture content for in case of for in case of higher compressive strength and constant slump value. Whereas in the case of constant higher compressive strength and varied slump value, the variation of water diffusion coefficient with moisture content is slightly increased at an initial stage with lower moisture content and goes on decreases with increased moisture content for in case of constant higher compressive strength and varied slump value for in case of designed mixtures type. it's possible to establish relationship between moisture content and time duration for in designed mixtures type. The moisture content is predominantly decreased at an initial stage as when compared to longer time duration for in case of all mixtures type. It's confirmed from the results that, the moisture content is significantly decreased for in case of higher compressive strength and varied slump. But in the case of lower compressive strength and constant slump, the variation of moisture content with time duration is slightly higher and goes on decreases with increased compressive strength for in case of designed mixtures type. From this research work that, it's possible to establish power type of equation between water diffusion coefficient and sorptivity coefficient in designed mixtures type. The water diffusion coefficient is lesser at an initial stage when the rate of absorption (sorptivity) is lesser at an initial stage for in case of all mixtures type. It's also confirmed from the results that, the water diffusion coefficient is co-related with sorptivity coefficient; in turn the average variation of water diffusion coefficient with sorptivity coefficient is slightly more for in case of higher compressive strength and varied slump. But in the case of lower compressive strength and constant slump, the variation of water diffusion coefficient with sorptivity coefficient is slightly higher in case of lower compressive strength and constant slump and goes on decreases with increased compressive strength for in case of designed mixtures type.

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Assessment of sorptivity coefficient in concrete cubes

Balakrishna MN, Fouad Mohamad, Robert Evans, Rahman MM

The quantity of water present in the concrete matrix controls many fresh and hardened properties of concrete such as workability, compressive strengths, permeability and water tightness, durability and weathering, drying shrinkage and potential for cracking. Thus the limiting and controlling the amount of water present in concrete matrix as well as cement paste is important for both constructability and an extension service life of concrete infrastructures. The successful key for making durable concrete is to limit its ability to transport fluids like water. In order to devise realistic testing methods, that determine the ability of concrete to withstand water penetration requires an understanding of water mobility. In order to build durable oriented and practicable concrete structures, it is needed to be able to accurately predict the water absorption, cumulative water absorption, sorptivity coefficient, relationship between cumulative water absorption and sorptivity within the concrete structures. Therefore, there is a need to quantify the sorptivity coefficient in concrete cubes which is of the most important factor in the concrete industries. The present research work is

made an attempt to interpret the concrete sorptivity coefficient in order to characterize the different concrete mixtures design for in case of concrete cubes. Thus the objectives of this present research are such as: First, this research will examine the influence of concrete ingredients on the results of water sorptivity performed on concrete cubes with different mixtures proportion in which slump, and w/c ratio value is varied with constant compressive strength as in the First case and compressive strength, and w/c ratio value varied with constant slump as in the Second case. Seventy-two concrete cubes (100 mm³) with Grades of concrete ranges from 25 to 40 N/mm² were prepared and evaluate the water sorptivity effect in designed different mixtures type. It's clear from the results that, the water absorption is co-related with square root of time by the tri-polynomial type of equation, in turn an average variation of water absorption is slightly more for in case of higher compressive strength and varied slump. But in the case of lower compressive strength and constant slump, the water absorption is slightly higher and its goes on decreases with increase in compressive strength and constant slump value. It's confirmed from the results that, the water sorptivity coefficient is co-related with square root of time by the power type of equation, in turn the average variation of sorptivity coefficient is more for in case of higher compressive strength and varied slump. But in the case of lower compressive strength and constant slump, the sorptivity coefficient was slightly higher and its goes on decreases with increase in compressive strength and constant slump value. As observed from the present results that, the water cumulative absorption is co-related with square root of time by the tri-polynomial type of equation, in turn an average variation of water cumulative absorption is more/less same for in case of higher compressive strength and varied slump as when compared with varied compressive strength and constant slump value. But in the case of lower compressive strength and constant slump, the water cumulative absorption is predominantly higher and its goes on decreases with an increase in compressive strength and constant slump value. Also its revealed from the results that, the water sorptivity coefficient is co-related with cumulative absorption by the power type of equation, in turn an average variation of sorptivity coefficient is more for in case of lower water cumulative absorption. The water sorptivity coefficient is goes on decreases with increased in water cumulative absorption. This may be due to, the pore structure may reached its saturation state. It's also observed from the results that, the sorptivity coefficient is found to be lesser for in case of higher compressive strength and varied slump value. Whereas the sorptivity coefficient is found to be more for in case of lower compressive strength and constant slump value and its goes on decreases with more increased water cumulative absorption. But the sorptivity coefficient is goes on reduced with increased compressive strength and constant slump value as well as with lesser water cumulative absorption.

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CHEMICAL SCIENCE

Performance Evaluation of Batch Reactor for Sodium Benzoate Production

Ukpaka CP

The performance of the Batch Reactor for the production of sodium benzoate from the reaction of sodium hydroxide and benzoic acid were investigated. The performance equation for the operation of batch reactor was developed for the analysis of the reactor's functional dimensions and parameters. The analysis of the reactor's functional parameters was performed at molar ratio of benzoic acid to sodium hydroxide of 1.5 to 3.0 at intervals of 0.5 and at the same reactor operating conditions. The set of reactors' performance equations were solved simultaneously and then, simulated with the aid of MATLAB R2015a computer program. The results of the analysis obtained for the batch reactor, although, showed that conversion, temperature and heat generated per reactor volume increases with increase in molar feed ratio, conversion and temperature increased with time, while the heat generated per reactor volume decreases with time. Following the results obtained from the analysis, the production of sodium benzoate from sodium hydroxide and benzoic acid can be executed in either of batch reactor depending on the capacity of production and conditions of operation. Finally, the optimum performance was observed at molar feed ratio of 3.0.

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SOCIAL SCIENCE

Occupational risk of maid servant at Bhola Sadar sub-district, Bangladesh

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Employment of servant for household activities is very common in the urban area of Bangladesh; where a large number of housewives go outside for jobs due to modernization and urbanization. They want to perform their daily work easily by getting help from others e.g. near relatives, maid servant. Bhola Sadar Upazila is an urbanized and populated city in coastal Bangladesh. About 85% housewives have practiced maid servant services for regular domestic purposes. This study focuses on assessment of socio economic condition of maid servant and the problems they face at their workplace. For conducting this studies both primary (household survey, focus group discussion, key informants interview) and secondary data are collected from different secondary sources viz. journal, books, organizational report. The major finding of this study is most of the maid-servant is young, came from nuclear family, large number of them is illiterate or have passed in primary level, monthly income is less than 2,000 BDT and have to work from 5.00 A.M. - 9.00 P.M. respectively in rotation or from one house to another in case of part time job. Most of them lives in slum; lead a monotonous life and have to struggle every day for their survival. They face a numerous problems like low level of wage, a minimal pay or no pay for extra work, absence of leave facility, sexual harassment, attack from water and air born disease etc. Occupational safety policy and regulation for maid servant need to be mainstreamed at national and local level.

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A research on burial rituals and skeleton remnants in Champapi Cemetery in Kafri Seimareh Strait

Lily Niakan

Central Zagros is considered to be one of the most important cultural realms in Iran's archaeological studies and different researchers have always found it interesting. Given its geographical location and environmental conditions, different elements have played their roles in shaping the culture of this realm. In the current study we study burial rituals and skeleton remnants in Champapi Cemetery in Kafri Seimareh strait. One of the most critical areas in Central Zagros is the large river of Samireh, located in impassable mountains, with big sources, fertile banks and permanent water. It has been a safe realm for groups of people over the past ten thousand years, so it has played an important role in the cultural interactions of the area. The findings from this area indicate that regarding social and economic factors Champapi has been a very complicated society in comparison with adjacent areas.

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