

عنوان مقاله:

Investigating the effect of nano-silica and micro-silica on the mechanical characteristics of high strength concrete

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خلاصه مقاله:

Today, the role of concrete as the most widely used building material in the development of the civil and economic infrastructure of societies is undeniable. On the other hand, the production of cement requires the consumption of natural resources and the release of a significant amount of carbon dioxide into the environment, so the need to revise and change the ingredients of concrete in such a way as to meet the needs of construction and to minimize risks and damage to the environment. It is necessary that pozzolans are among the materials that can be used to improve this. Iran is one of the countries that can be a leader in this matter due to its diverse geographical areas and the availability of various mines. Therefore, this research presents the effect of using nano-silica (NS) and micro-silica (SF) of Hamadan city on the mechanical properties of ultra-high-strength concrete (UHPCs). For this purpose, two groups of concrete with and without silica fume (SF) were made. Also, nano silica (NS) was used as an additive to cement in amounts of 0%, 0.5%, 1%, 2% and 3%. In general, the results show the appropriate effect of pozzolanic materials produced in Iran in improving the properties of concrete in a way that gives that among the different contents of NS, UHPC containing 2% NS has the best results in terms of compressive strength, tensile strength, modulus of elasticity, and bending strength. Shown in 90 days. Also, UHPC samples containing dual cement materials (NS and SF) showed better results than concretes containing only NS

کلمات کلیدی:

nano-silica, Concrete, micro silica, high strength concrete, mechanical characteristic

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