

## عنوان مقاله:

(The effect of freeze-thaw cycles on concretes containing Titanium dioxide nanoparticles (Tio2

## محل انتشار:

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## خلاصه مقاله:

Since concrete structures are in direct contact with weather conditions and environmental destructive agents, issues related to shelf life and durability has always been of interest to researchers. One issue that has had the most destructive effect on concrete structures in cold and wet environments, is the successive cycles of freezing and thawing on the one hand, nanotechnology in recent decades has made it possible for nanomaterials to be used for the improvement level of serviceability in building materials. The aim of this study is to examine the effect of successive cycles of freezing and thawing on durability of concretes containing Titanium dioxide nanoparticles (Tio2. To achieve this end, concrete samples ratio of water-cement constant (w/c) equal to 0.53 and four designs by substituting 0%, 2%, 3.5% and 5% wt% cement materials with titanium nanodioxide was made. Thus, four blending designs in the form of 40 concrete samples were made. The samples were in accordance with standard ASTM-C666-B which were subjected to freezing and thawing conditions. To compare the blending designs against frost, weight variations, length and compressive strength of samples following and prior to freezing conditions were taken into account. It was shown in this study that adding titanium nanodioxide particles to concrete initially and after 28 days has caused compressive strength loss, however, adding these particles to concrete causes a significant increment in improvement and durability of concrete against freezing phenomenon. Also, optimal percent in order to have the least compressive strength loss and to enhance durability against frost, being 2wt% cement

## کلمات کلیدی:

Concrete durability, Titanium dioxide (Tio2), Freeze-thaw cycles, Nanomaterials

## لینک ثابت مقاله در پایگاه سیویلیکا:

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