



ELSEVIER

Contents lists available at ScienceDirect

Data in Brief

journal homepage: www.elsevier.com/locate/dib

Data article

Dataset of producing and curing concrete using domestic treated wastewater

Gholamreza Asadollahfardi ^{a,*}, Mohammad Delnavaz ^a,
Vahid Rashnoiee ^a, Alireza Fazeli ^b, Navid Gonabadi ^c^a Civil engineering department, Kharazmi University, Tehran, Iran^b Vancouver Community College, Vancouver, BC, Canada^c Iran Novid Azma Laboratory, Tehran, Iran

ARTICLE INFO

Article history:

Received 9 December 2015

Accepted 9 December 2015

Available online 17 December 2015

ABSTRACT

We tested the setting time of cement, slump and compressive and tensile strength of 54 triplicate cubic samples and 9 cylindrical samples of concrete with and without a Super plasticizer admixture. We produced concrete samples made with drinking water and treated domestic wastewater containing 300, 400 kg/m³ of cement before chlorination and then cured concrete samples made with drinking water and treated wastewater. Second, concrete samples made with 350 kg/m³ of cement with a Superplasticizer admixture made with drinking water and treated wastewater and then cured with treated wastewater. The compressive strength of all the concrete samples made with treated wastewater had a high coefficient of determination with the control concrete samples. A 28-day tensile strength of all the samples was 96–100% of the tensile strength of the control samples and the setting time was reduced by 30 min which was consistent with a ASTM C191 standard. All samples produced and cured with treated waste water did not have a significant effect on water absorption, slump and surface electrical resistivity tests. However, compressive strength at 21 days of concrete samples using 300 kg/m³ of cement in rapid freezing and thawing conditions was about 11% lower than concrete samples made with drinking water.

© 2015 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

DOI of original article: <http://dx.doi.org/10.1016/j.conbuildmat.2015.12.039>

* Corresponding author.

E-mail address: asadollahfardi@yahoo.com (G. Asadollahfardi).<http://dx.doi.org/10.1016/j.dib.2015.12.020>2352-3409/© 2015 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

Specification Table

Subject area	Construction and environment
More specific subject area	Construction material and wastewater reuse
Types of data	Tables, figures and text files
Data format	Raw, filtered and analyzed
How the data were acquired	Scanning electron microscope (SEM), energy-dispersive X-ray spectroscopy (EDX)
Experimental factor	The effect of using treated wastewater on the characteristics of concrete
Experimental features	Using EDX to find percentage of most elements in both concrete samples which made with drinking water and treated wastewater
Data source location	Khoramabad City, Iran, latitude 33.488° and longitude 48.335°
Data accessibility	The data presented in this article and is related to the research paper

1. The value of data

- The data indicate the suitability of treated domestic wastewater for producing concrete.
- The data illustrate the initial setting time of cement made with treated domestic wastewater is higher than the cement made with drinking water.
- A high coefficient of determination exists between the compressive strength data of concrete produced with drinking water and concrete produced by the treated domestic wastewater.
- The water absorption and surface electrical resistivity data of the concrete samples made with treated domestic wastewater and drinking water had approximately similar results.
- The compressive strength of concrete samples, under rapid freezing and thawing, with 300 kg/m³ of cement which made with treated wastewater at 21 days was 10.11% lower than concrete samples made of drinking water

2. Data 1

The strength and durability of concrete is very dependent on the chemical characteristics of cement. According to ACI 201 [1] concrete durability containing Portland cement depends on its ability to resist weathering action, chemical attacks, abrasion or any process which causes damage to concrete. The type 2 Portland cement produced by the Lorstant cement factory was selected and tested using the ASTM-C150 (2004) standard [2]. Table 1 presents the chemical characteristics of type

Table 1
Type 2 Portland cement specifications used in this study.

Chemical compounds of type 2 Portland cement	Maximum and minimum permissible	Testing results
Silicon Dioxide (SiO ₂)	20 (minimum)	21.55
Aluminum Oxide (Al ₂ O ₃)	6 (maximum)	5
Ferric Oxide (Fe ₂ O ₃)	6 (maximum)	4.3
Magnesium Oxide (MgO)	5 (maximum)	1.78
Sulfur TriOxide (SO ₃)	3 (maximum) 3	2.09
Loss on Ignition (LOI)	3 (maximum)	1.08
Insoluble Residue (I.R)	0.75 (maximum)	0.5
Fineness (Blaine Test, cm ² /gr)	2800 (minimum)	3000

Download English Version:

<https://daneshyari.com/en/article/175047>

Download Persian Version:

<https://daneshyari.com/article/175047>

[Daneshyari.com](https://daneshyari.com)