

Use of greywater in production of mortar and concrete

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Currently, ready mix concrete is one of the most common construction materials. Concrete can be considered as one of the largest water consumer. The actual Jordanian need of cement is about 4.5 Mt/y. Around 3.7 Mm³/y of fresh water is needed to prepare ready mix concrete. Recently, the problem of water shortage in Jordan has become worse as a result of high population growth, influxes of refugees. Therefore, wastewater treatment and reuse for ready mix concrete industry is a high priority and rational action. This study will evaluate and investigate the potential of substitution of fresh water by treated wastewater partially or totally to produce ready mix concrete in Jordan. Raw greywater and treated greywater samples were collected from greywater filtration pilot plant in Jordan valley and analyzed. Control mortar and concrete mix were designed. Greywater was utilized for separate mixes. The other components of mixtures were kept constant as those in the control one except water type. Cured mortar and concrete specimens for each mix were tested at 7 days age as strength indication, while the other specimens were tested at 28 days to obtain compressive strength. The mortar and concrete compressive strength results obtained at 7 days moist curing time represent no significant differences. At 28 days, treated greywater mortar and concrete samples show significant increase in compressive strength on contrary the raw greywater achieved negative impact on compressive strength. In conclusion, treated greywater is a potential alternative for fresh water in ready mix concrete industry.

Biography

Ayoub M Ghrair holds a PhD degree in Geochemistry and Nanomaterial/Soil Science and Land Evaluation from Hohenheim University/Stuttgart-Germany. Currently, he is working at the Royal Scientific society. He is interested in Materials Science and Environmental Study. He published over 20 publications, conferences and booklet in international journals and has two patents. He was awarded from DAAD (2004-2009). In addition, he has been funded for scientific research in environmental issues from five organizations (SRTD I, SRTD II, SRSF, HMCSR, USAID, NSF). He has strong scientific networking on national and international level.

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