

Accepted Manuscript

The effect of compaction on the Leaching and pollutant emission time of recycled aggregates from construction and demolition waste

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PII: S0959-6526(14)00802-6

DOI: [10.1016/j.jclepro.2014.07.074](https://doi.org/10.1016/j.jclepro.2014.07.074)

Reference: JCLP 4566

To appear in: *Journal of Cleaner Production*

Received Date: 12 December 2013

Revised Date: 29 May 2014

Accepted Date: 26 July 2014

Please cite this article as: Galvín AP, Ayuso J, García I, Jiménez JR, Gutiérrez F, The effect of compaction on the Leaching and pollutant emission time of recycled aggregates from construction and demolition waste, *Journal of Cleaner Production* (2014), doi: 10.1016/j.jclepro.2014.07.074.

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1 **THE EFFECT OF COMPACTION ON THE LEACHING AND POLLUTANT**
2 **EMISSION TIME OF RECYCLED AGGREGATES FROM CONSTRUCTION**
3 **AND DEMOLITION WASTE**

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12
13 **Abstract**

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15 Urban solid waste from demolition and construction engineering sites has been demonstrated to be
16 mechanically suitable for reuse in civil infrastructures. However, the application of recycled materials as
17 a replacement for natural aggregates demands an assessment of the pollution potential of the material in
18 its second life cycle.

19 Actually, plant managers of construction wastes assess the materials according to concise leaching tests
20 that do not consider the compaction stage of the materials when they are applied in civil infrastructures.
21 For that reason, the aim of the present study is to evaluate the effect of compaction on the leaching
22 behaviour of concrete and mixed recycled aggregates.

23 A percolation test for materials under compaction conditions was designed. The release levels measured
24 in the water percolated through the compacted aggregates were compared with a conventional percolation
25 leaching test. Besides, the compliance test allowed identifying the most conflictive elements according to
26 the measured concentrations in the leachate: chromium and sulphate. The results revealed that under
27 compaction, the highest levels of release were obtained for the concrete material. It was due to its high
28 susceptibility to compaction which increased the content of fine particles affecting to the leaching
29 behaviour. The study also includes the formulation of an equation to determine the emission release time
30 of pollutants. Calculations were developed for two common applications as granular material:
31 embankments and structural road layers.

32
33 **Keywords**

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35 *Environmental management; Demolition waste; Compaction; Pollutant potential; Leaching behaviour*
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