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

A.P. Galvín, J. Ayuso, I. García, J.R. Jiménez, F. Gutiérrez

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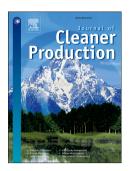
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ACCEPTED MANUSCRIPT

1	THE EFFECT OF COMPACTION ON THE LEACHING AND POLLUTANT
2	EMISSION TIME OF RECYCLED AGGREGATES FROM CONSTRUCTION
3	AND DEMOLITION WASTE
4	
5	A.P. Galvín ^a *, J. Ayuso ^a , I. García ^b , J.R. Jiménez ^a , F. Gutiérrez ^c
6	
7	^a Construction Engineering. University of Cordoba.UCO-Ed. Leonardo Da Vinci – Campus of Rabanales,
8	14071 – Cordoba, Spain
9	^b SCAI. Central Support Service to Research of University of Córdoba. Campus of Rabanales, 14071 –
10	Cordoba, Spain
11	^c LAB. TCAL- Testing and calibration. Construction Department, Lucena 14900 – Córdoba, Spain
12	
13	Abstract
14	
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 20	Actually, plant managers of construction wastes assess the materials according to concise leaching tests
21	that do not consider the compaction stage of the materials when they are applied in civil infrastructures 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
34	
35	Environmental management; Demolition waste; Compaction; Pollutant potential; Leaching behaviour
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