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Corrigendum

Corrigendum to "Metal scarcity and sustainability, analyzing the necessity to reduce the extraction of scarce metals" [Resour. Conserv. Recycl. 93 (2014) 1–8]

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The authors regret to inform that there is error in the zirconium data provided in Table 2.

For zirconium, Table 2 of the publication erroneously states a 2010 extraction of 1250 tons of Zirconium. This should be 1,250,000 tons of Zirconium mineral gross weight.

Explanation

According to a USGS publication of 1992 (Zirconium and Hafnium-1992 by Gambogi J.M.), commercially available zircon (zirconium concentrate) has a typical analysis of 64.5–66% of zirconium dioxide-hafnium dioxide in a ratio of 50 parts zirconium to 1 part hafnium. We have assumed a 65% zirconium dioxide concentration in zirconium concentrate. This results in a 48% Zr content in zirconium concentrate ($65 \times 91.2/123.2$). This means that the globally extracted 1,250,000 tons of zirconium concentrate in 2010 contain 600×1000 tons Zr.

This results in an expected yearly extraction in 2050 of 1957×1000 tons of Zr and a cumulative extraction between 2010 and 2050 of $47{,}000 \times 1000$ tons of Zr.

The remaining available resources in 2050 remain unchanged: 7600 million tons (rounded). This means that the remaining years after 2050 until depletion need to be changed in 3900 years.

The error affects only the zirconium data in Table 2.

The corrected zirconium figures are included in the below table.

The authors would like to apologize for any inconvenience caused.

Table 2
Remaining lifetime (after 2050) for exploitation of metals until depletion.

Metal	Extraction in 2010 (×1000 ton) (a)	Yearly extraction in 2050. yearly growth 3% (×1000 tons) (b)	Approximate total extraction between 2010 and 2050 (×1000 tons) (c)	Extractable Global Resources according to UNEP (2011a) (million tons) (d)	Remaining available resources in 2050 (million tons) (e)	Remaining years after 2050 until depletion (f)
Zr	600	1957	47,000	7600	7600	3900

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