Letters

Heavy metal—music, not science

Scientists by definition strive for precision in their work and in their terminology. It is thus distressing to see an imprecise and incorrect term in general usage in scientific publications, including *ES&T* (*1*). I refer to the term "heavy metals". Although no authoritative definition for this term exists (e.g., try a Google search), it is often incorrectly assumed to identify substances that are highly toxic and bioaccumulative (*2*). It is past time to implement the recommendation from the International Union of Pure and Applied Chemistry (IUPAC) and others that a new classification of metals is needed that is based on the periodic table (*2–5*). In the meantime, the term "heavy metals" should be replaced by simply "metals" (or "metalloids", in the case of B, Si, Ge, As, Sb, Te, Po, At, and Se). Authors and editors need to rigorously edit out the "heavy" metals—unless the reference is musical, not scientific (i.e., energetic and highly amplified rock music having a hard beat).

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(3) Conrad, B. R. Terminology for Metals. *Soc. Environ. Toxicol. Chem. News* **1999**, *19* (5), 15–16.
(4) Hodson, M. E. Heavy Metals—Geochemical Bogey Men? *Environ. Pollut.* **2004**, *129*, 341–343.
(5) Nieboer, E.; Richardson, D. H. S. The Replacement of the Non-Descript Term "Heavy Metals" by a Biologically and Chemically Significant Classification of Metal Ions. *Environ. Pollut. B* **1980**, *1*, 3–26.

Cell-phone hazards

I am writing to express my deep concern with the methodologies used and the results of the tests cited in the study "Leaching Assessments of Hazardous Materials in Cellular Telephones" (*Environ. Sci. Technol.* **2007**, *41*, 2572–2578). The *ES&T* article is itself being cited globally as evidence in order to classify cellular telephones as hazardous waste. I believe these conclusions to be misleading. The central premise—using a hammer mill and particle sieve to shred the telephones—does not in fact reflect the reality of disposal.

Cellular telephones are manufactured to withstand reasonable use by the consumer. The case, component packaging, and subassemblies are all manufactured in order to be able to function in a wide range of operating environments. These electronic devices require moisture-, shock-, and trauma-protective packaging simply to be able to operate. At the end of the product life cycle, the user typically disposes of the device in a normal fashion, dropping it into the trash, where in the vast majority of cases it will sit for thousands of years without decomposition. The casing, keypad, and most components exposed to the environment are either inorganic or highly resistant to decomposition.

The original study by Townsend of the University of Florida on lead leachate from electronic devices was apparently reconsidered by the author for similar reasons. That this was the basis for the EU Restriction of Hazardous Substances regulations is of concern. In fact, what has been seen in industry to date is that the alternatives to the use of lead are cumulatively worse for the environment than the original culprit. Methodology that does not reflect reality leads to poor policy decisions that will affect not only us but future generations as well.

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