

## Letters

**Response to “The Flyleaf Periodic Table”**

Clark and White examined 35 introductory and general chemistry textbooks to ascertain which periodic table was most often presented on the flyleaf. Their data show that three versions of the periodic table are most commonly used; however, their data also show that the majority of textbooks use a periodic table with lanthanum and actinium in the d-block below yttrium (1). In their letter Clark and White wonder why the chemistry education community has not uniformly adopted just one form of the periodic table. Part of the answer is that the majority who are silent on this issue do not want to be attacked by the vocal proponents who insist that lanthanum and actinium must be in the f-block and lutetium and lawrencium must be in the d-block. On page 1482 of this issue, “Lanthanum and Actinium Should Remain in the d-Block”, I list some of the reasons why the majority prefer this form of the periodic table (2). I do not wish to enter into conflict but hopefully my article gives voice to those who have been silent. Perhaps our university chemistry textbooks should include brief mention of the difficulties on having one form of the periodic table.

The periodic table adopted by IUPAC (3) also places lanthanum and actinium below yttrium in group 3 (IIIB) in the d-block. However this is only seen after the viewer visualizes the placement of their lower block into the spaces indicated by the numbers 57–71 and 89–103 in their periodic table. Only then does one also see that the IUPAC periodic table does not include lanthanum and actinium as part of the f-block and that their f-block is in fact fourteen groups. Unfortunately IUPAC’s representation of the periodic table can mislead a viewer into thinking that lanthanum and actinium are not below yttrium in group 3 when they are, that lanthanum and actinium are part of the f-block when they are not, and that their f-block has fifteen groups when it does not. Clark and White appear to have made this error by referring to the IUPAC periodic table as “15LaAc”.<sup>1</sup>

Hopefully, IUPAC will make this clearer in subsequent representations of the periodic table. One suggestion is a uniform and different color of their f-block for the 14 groups starting with cerium and ending with lutetium. This would visually assist viewers and thereby prevent the above mistakes. Another suggestion is to explicitly place lanthanum and actinium in the two

blank spaces below yttrium in group 3 as this would avoid any confusion as where these two elements are located and would also make clear that there are 14 groups in the f-block of the IUPAC periodic table.

Lastly, the IUPAC periodic table is referred by some as the “European” version (or format) and by others as the “15 f-block” version. As discussed above referring to the IUPAC periodic table as the “15 f-block” version is incorrect, and since the (American) National Institute of Standards and Technology (NIST) uses the identical layout and placement of the elements in their periodic table (4) it is similarly misleading to refer to the European version or the American version of the periodic table when they are one and the same (3, 4).

**Note**

1. In the 15LaAc representation 15 represents the number of groups in the f-block and La and Ac are the first elements in each row of the f-block.

**Literature Cited**

1. Clark, R. W.; White, G. D. *J. Chem. Educ.* **2008**, *85*, 497.
2. Lavelle, L. J. *J. Chem. Educ.* **2008**, *85*, 1482–1484.
3. IUPAC Periodic Table. [http://www.iupac.org/reports/periodic\\_table/IUPAC\\_Periodic\\_Table-22Jun07b.pdf](http://www.iupac.org/reports/periodic_table/IUPAC_Periodic_Table-22Jun07b.pdf) (accessed Aug 2008).
4. National Institute of Standards and Technology Periodic Table. <http://physics.nist.gov/PhysRefData/PerTable/index.html> (accessed Aug 2008).

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