Re-inventing the wheel: A new Periodic Table

Re-inventar la rueda: Una nueva Tabla Periódica

James L. Rota
Universidad de Canadá, Canadá
jrota@rotaperiod.com

The periodic table is a tool that caught the imagination of most people because of its simplicity at handling something complex. It was easy to understand and convincing, so it became the tool most elemental scientists have used to support their theories. However, when the periodic table expanded to include more elements and became the medium long form, it lost its simplicity and became more difficult to understand. The Rota Period is based upon a better design model. This paper explains why the Rota Period was created and what was learned along the way about the history of the periodic table.

Statement of the issue: The medium long form of the periodic table is challenging to teach/learn and has inconsistencies that cause a lot of debate among theoretical scientists (e.g. metals versus non-metals, position of La and Ac, 3 columns for group VIIIb - an issue now obscured by the recent 1 to 18 column IUPAC version). The author asserts that the reason for these great debates and why it is difficult to teach/learn is because it is based upon a 1 dimensional design model (horizontal row constraint) which is inflexible. This 1 dimensional, horizontal row constraint design has forced theorists to try and fit their round (or other-shaped) theories into a square hole. Instead of letting the theory(s) dictate the shape of the periodic table (form following function), it is the horizontal row model of the periodic table which determines the validity of most elemental theories today. This tail has been wagging the dog for the last 100 years and needs to change for science to progress.

Practical Solution: Use a better design model (2 dimensional). By allowing a vertical component to help specify the position of an element, the design is more flexible.

For example: *Today's Periodic Table:* Horizontal Row Constraint (1 Dimensional):

A B C D

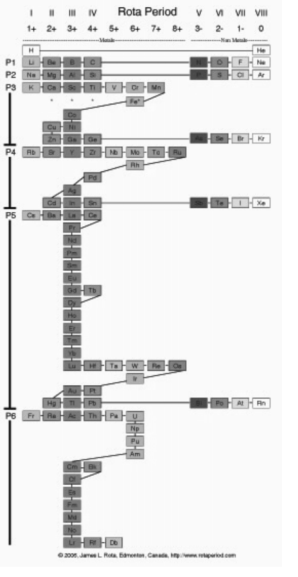
- Not flexible
- Leads to very long (18 – 32 column) designs.
- Causes a lot of confusion and debate as it tries to accommodate a variety of theoretical challenges.

Future Periodic Table: Allow Vertical Component (2 Dimensional):

A
B C
D

- Flexible.
- Maintains valences (one of the primary reasons for having a periodic table), still shows the s, p, d, f orbitals (with more information than a 1 dimensional design can do), still supports quantum mechanics.
- Easier to teach/learn and remember.

Using a design model that allows both the horizontal and vertical to position the elements (2 dimensions instead of 1) provides the scientific community with a better method of defining the ideal shape of the periodic table. This new design concept is more consistent, easier to teach and easier to learn. The design is flexible, making it better able to handle theoretical debate(s); removes most of the inconsistencies and is easier to remember.



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Keywords: periodic table, chemistry, ROTA Period