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Periodic Table of Electronic Elements: Application and future simulation

Gabriel Luna-Sandoval *[1], Luis Espinoza, Sergio Félix, Martín Santacruz-Tirado, Eusebio Jiménez-López

Abstract: This paper presents an analogic case of a representative Periodic Table of Elements as we know it but with another specific use. The new Periodic Table of Electronics Elements (PTEE) presents in a friendly perspective all electronic elements in order to assimilate better, it should be used in all education institutes where electronics is taught. Also can be transform this new PTEE to be used as a simulator linked all elements to a database showing the technical characteristics of the selected electronic element and its applications. PTEE is being tested in some education subjects where basic electronics are taught with a positive results.

Keywords: *Electronic, table, elements, simulation, application.*

1. Introduction

The periodic table of elements (PTE) is a tabular arrangement of the chemical elements, organized on the basis of their atomic numbers, electron configurations, and recurring chemical properties. Elements are presented in order of increasing atomic number. The standard form of the table consists of a grid of elements laid out in 18 columns and 7 rows, with a double row of elements below that. The table can also be deconstructed into four rectangular blocks: the s-block to the left, the p-block to the right, the d-block in the middle, and the f-block below that.

The rows of the table are called periods; the columns are called groups, with some of these having names such as halogens or noble gases. Since, by definition, a periodic table incorporates recurring trends, any such table can be used to derive relationships between the properties of the elements and predict the properties of new, yet to be discovered or synthesized, elements. As a result, a periodic table provides a useful framework for analyzing chemical behaviour, and such tables are widely used in chemistry and other sciences.

Although precursors exist, Dmitri Mendeleev is generally credited with the publication, in 1869, of the first widely recognized periodic table. He developed his table to illustrate periodic trends in the properties of the then-known elements. Mendeleev also predicted some properties of then-unknown elements that would be expected to fill gaps in this table. Most of his predictions were proved correct when the elements in question were subsequently discovered. Mendeleev's periodic table has since been expanded and refined with the discovery or synthesis of further new elements and the development of new theoretical models to explain chemical behavior.

All elements from atomic numbers 1 (hydrogen) to 118 (ununoctium) have been discovered or reportedly synthesized, with elements 113, 115, 117 and 118 having yet to be confirmed. The first 98 elements exist naturally although some are found only in trace amounts and were initially discovered by synthesis in laboratories. Elements with atomic numbers from 99 to 118 have only been synthesized, or claimed to be so, in laboratories. Production of elements having higher atomic numbers is being pursued, with the question of how the periodic table may need to be modified to accommodate any such additions being a matter of ongoing debate. Numerous synthetic radionuclides of naturally occurring elements have also been produced in laboratories.

Now, making an analogy this paper presents the periodic table of electronic elements which was born from the idea of professor Luis Espinoza in 2007, considering that the current educational programs has not the range of a technician requirements like an electronic repairman in the manufacturing sector. With this experiences the professors are working with students to strengthening the concepts of each electronic component and its performance when different electronic elements are connected together.

We find that a simple and easy tool (PTEE) that shows and strengthen the concepts of each electronic component and its interaction with others components.

2. Periodic table of electronics elements

Like periodic table of elements, in the PTEE the elements are presented in order of increasing a symbolic element number. As PTE, the standard form of the PTEE consists of a grid of elements laid out in 18 columns and 7 rows, with a double row of elements below that.

The table can also be deconstructed into four rectangular blocks: the s-block to the left, the p-block to the right, the d-block in the middle, and the f-block below that.

In the PTEE rows of the table are called periods; the columns are called groups, with some of these having names such as resistances or diodes, as shown in Fig. 1

[1] *Universidad Estatal de Sonora, Mexico.*
** Corresponding Author: Email: gabriel.luna@ues.mx*
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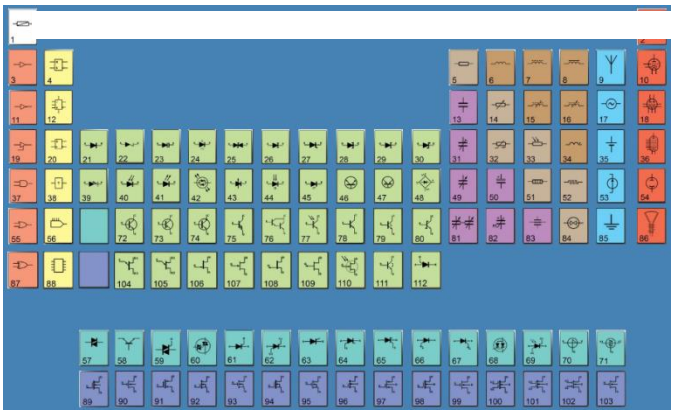

Figure 1. Periodic table of electronic elements.

Also it will be added Table 1 in the PTEE to identify the groups of the electronic elements with colours of the rows and columns.

Table 1. Groups with colours of the Electronic elements in the PTEE.

Puertas Lógicas	Circuitos Lógicos	Diodos Transistores	Diac, Triac Tristor	Mosfet
Condensadores	Resistencias	Bobinas	Generadores	Válvulas

The entire list of electronic elements it will be added to the PTEE, as summarized in Table 2.

Table 2. Some corresponding numbers of some Electronic elements in the PTEE.

1	Fusible
2	Diodo
3	Buffer
4	Bascula R-S
5	Resistencia
6	Bobina Inductor
7	Bobina Núcleo De Fierro
8	Bobina Núcleo De Fe-Si
9	Antena
10	Triodo
11	Inversor
12	Bascula J-K
13	Capacitor General
14	Resistencia Variable
15	Bobina Ajustable
16	Bobina Variable
17	Generador De Corriente Alterna
18	Triodo Doble
19	Buffer Triestado
20	Bascula D
21	Diodo Rectificador

Table 2, Continuation. Some corresponding numbers of some Electronic elements in the PTEE

22	Diodo Zenner
23	Diodo Varicap
24	Diodo Gun Impatt
25	Diodo Schottky
26	Diodo De Corriente Constante
27	Diodo De Recuperacion Instantanea Snap
28	Diodo Tunel
29	Diodo Rectificador Tunel
30	Diodo Schottky
31	Capacitor Ajustable
32	Termistor (Ntc) Coeficiente De Temp. Neg
33	Ldr Fotoresistor
34	Polaridad De Bobinado
35	Generador De Tension Continua
36	Octodo
37	Compuerta And
38	Flip Flop T
39	Diodo Pin
40	Fotodiodo
41	Diodo Emisor De Luz “Led”
42	Diodo Bicolor Polaridad Dual
43	Diodo Laser
44	Diodo Magnetico
45	Diodo Sensible A La Temperatura
46	Diodo De Ruptura Bidireccional Pnp
47	Diodo De Ruptura Bidireccional Npn
48	Puente Rectificador
49	Capacitor Variable
50	Capacitor Electrolitico
51	Elemento De Calefaccion
52	Resistencia No Reactiva
53	Generador De Corriente Continua
54	Celula Fotoelectrica
55	Compuerta Or
56	Convertidor Analogico Digital “Dac”
57	Diac
58	Trigger Diac
59	Triac
60	Ditriac/Quadrac

Table 2. Continuation. Some corresponding numbers of some Electronic elements in the PTEE

68	Darlington
69	Fotoresistor
70	Sus Silicon Unilateral Swicht
71	Sbs Silicon Bilateral Swicht
72	Transistor Npn
73	Transistor Pnp
74	Transistor Npn Colector Unido A La Cubierta
75	Multiemisor Npn
76	Darlington Npn
77	Fototransistor Npn
78	Darlington Pnp
79	Transistor De Avalancha
80	Transistor Schottky Npn
81	Capacitor Variable Agrupado
82	Capacitor Polarizado Sensible A La Temperatura
83	Capacitor Pasante
84	Varistor "Vdr" Resistencia Dependiente De La Tension
85	Linea De Tierra
86	Tubo De Rayos Catodico Crt
87	Compuerta "O" Exclusiva
88	Circuito Integrado General
89	Tipo Empobreciemiento (Depletion) 3 Treminales
90	Tipo Empobreciemiento Depletion 3 Terminales
91	Tipo Empobrecimiento Depletion 3 Terminales
92	Tipo Enrequicimiento Sustrato Unido Al Surtidor 3 Terminales

3. Interactive PTEE

The next premise and innovation to the PTEE is to apply an interactive educational and simulation way. Using an executable file containing 4 links: the PTEE, electronic Laws, formulas and resistance colour codes it is giving a new teaching tool to the professor and a new learning tool to the student, as shown in Fig. 2.

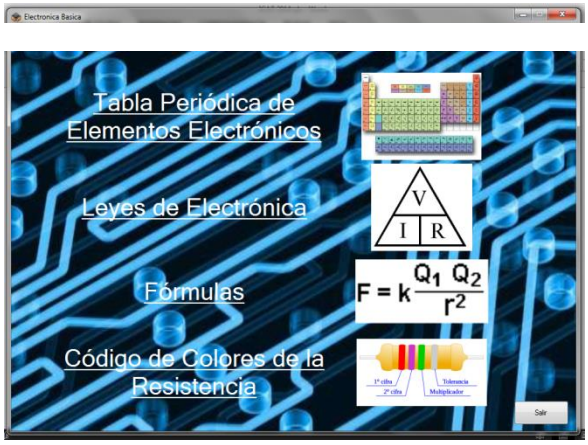

Figure 2. Executable file that contains the PTEE, electronics Laws, formulas and resistance colour codes.

As When the students need to reinforce the knowledge in any content of the 4 links from the executable file, they should click on the link to open a windows that shows all information about the topic selected.

Clicking the link, the teacher and student will find the concept and application of the electronic element, as shown in Fig. 3.

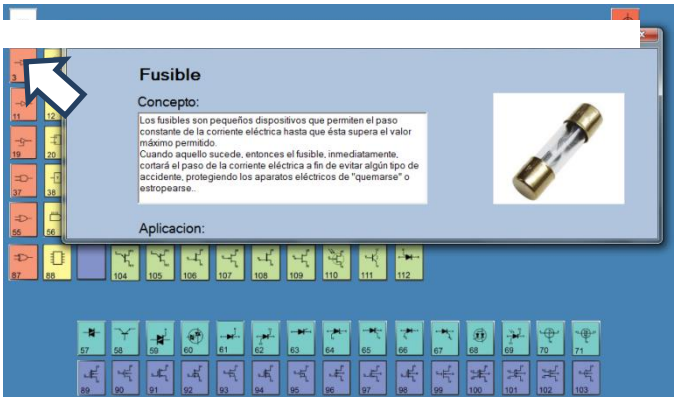

Figure 3. Interactive periodic table of electronic elements.

4. Conclusion

In The premise of the periodic table of electronic elements has been well received by students of electronic in college. This useful teaching tool are contributing to enhance the knowledge in students and an easy way to teachers to teach in the classroom. The interest and learning of the students are reflected in their final excellent scores unlike other semesters without the use of the PTEE. The innovative PTEE should be used in all educational institutes around the world where electronics subjects are teaching. Finishing the interactive PTEE the results will be published in other paper presenting how students and teachers was benefited with this educational tool.

future.

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