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I 37: A BOHR'S THEORY PREDICTION OF THE UPPER LIMIT FOR THE NUMBER OF CHEMICAL ELEMENTS

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***Abstract.** The semi-classical Bohr's model, although it is an incomplete and old theory, is one of the first approximations to the one electron atom that students learn. In this paper an answer is given using this model to a question that can often arise in introductory chemistry or atomic physics courses when dealing with the subject of the periodical table, namely if there is an upper limit for the number of chemical elements. It is hoped that the manuscript could be useful to teachers and students to learn about this question since the very first physics and chemistry courses.*

***Keywords:** periodic table, Bohr's model, atom, chemical elements*

There are today 112 known chemical elements if we consider a synthetic radioactive Copernicium (symbol Cn, its nucleus contains $Z=112$ protons) as the highest numbered element officially recognized by the International Union of Pure and Applied Chemistry (IUPAC) [1] (see Fig. 1). How many other elements could exist is a question that can often arise in physics and chemistry courses at different levels and a theme that to the best of the author's knowledge has not been considered yet in current text books. We will demonstrate briefly here how the ancient Bohr's theory for the one electron atom could be helpful to explain in introductory courses that there must be an upper limit for the number of chemical elements. This approach could be useful, for example, when students have their first approaches to the periodic table of chemical elements in undergraduate courses and are not yet familiar with the basic concepts of quantum mechanics and therefore with more advanced atom models.