Journal of
Chemical Engineering & Process Technology

Tamir, J Chem Eng Process Technol 2013, 4:9
DOI: 10.4172/2157-7048.1000e117

Editorial Open Access

Chemical Reactions via Art

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In medieval times, chemistry-the science of chemical reactions-as we know it today, did not exist, and instead, alchemy was popular. The main objectives of alchemy were to find the appropriate combination of ingredients that would cure all illness and diseases, to find the chemical that would prolong life, and to convert lead into gold. Nowadays, the above goals have not been neglected possibly just realistically modified.

Chemical reactions are processes by which the original substances change into new ones by the making or breaking of chemical bonds. Interesting reactions, not yet well understood, are those taking place in our brain. When we think a thought or feel a sensation from the outside world, it is the result of chemical reactions in our brain; drugs and food can have a significant effect upon our brain chemistry.

Each chemical is characterized by a symbol or a formula derived from the scientific name of the element, where a specific reaction is described as a combination of the formula of the reactants and products. A general representation of reactions is made by using letters, for example, A→B etc.

The major aim in the following is to present alternative approaches of describing chemical reactions, namely, via art, which adds aesthetics to the regular presentation of reactions, and, probably, more attraction.

One approach is based on Escher's geometric shapes demonstrated in Schattschneider's book [1]. Maurits Cornelis Escher (1898-1972), Dutch, an extremely talented graphic artist, was born in the town of Leeuwarden. In 1919 he moved to Haarlem to attend the School of Architecture and Decorative Arts with an intention of preparing for a career as an architect. It was sometime around 1922 that Escher started to be interested in the so called 'regular division of the plane' in which color and symmetry were inherently bound, and for which he gave the following description: a plane, which should be considered limitless on all sides, can be filled with or divided into similar geometric figures that border each other on all sides without leaving any 'empty spaces'. For example, a floor can be covered with tiles that are all the same shape and size. In the most common cause the tiles are squares, which is the simplest way of dividing a plane regularly. A more complicated case is tiles of triangular or hexagonal elements successively. Escher developed this ides further by filling the plane with many motifs such as flowers, fish, reptiles, butterfly, faces, etc., where in all cases he kept the requirement not to leave any 'empty space'. In addition, combination of different colors added considerably to the aesthetics of this artwork (Figure 1). And indeed, this was Escher's major contribution to decorative art, an area in which he was the greatest. A few examples of motifs are shown on the back page where the basic motif has been emphasized with respect to the background composed of it. These motifs, on the other hand, were applied to demonstrate different kinds of chemical reactions, the major objective of this article. It should be indicated also that Escher's motifs are numerous, and it is easy to find enough of which to replace the regular A, B… Z symbols used in chemical reactions presentations.

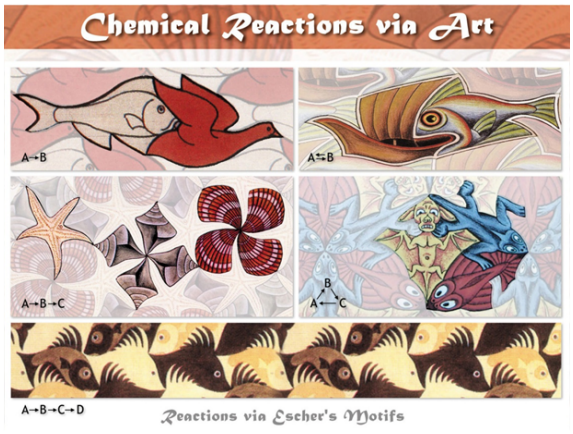

Figure 1: Regular division of the plane.

In conclusion, are not chemical reactions more attractive and aesthetic when presented via art?

References

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Received August 28, 2013; **Accepted** August 28, 2013; **Published** August 30, 2013

Citation: Tamir A (2013) Chemical Reactions via Art. J Chem Eng Process Technol 4: e117. doi: 10.4172/2157-7048.1000e117