



SEGUNDO LUGAR, CATEGORÍA MENOR (13-15 años)- INGLÉS

Crystallographic Relevance

Gerardo Padilla Corrales,
Colegio Científico de Pérez Zeledón

Maybe the word “crystallography” is not so popular among people who doesn't work on fields that depend on the knowledge that it gives, but in these few words I'll try to explain why it is still important even for those who had never heard about it, and I'll try to give a little idea about what is it about.

People always wonder why things react the way they do, that is the reason why science was born, but to know how something reacts and why, scientists are restrained to observe that something, try to find the simple nature of its components (in the case of complex structures) and how they react with each other from a micro system to the large scale original system that they were studying. Could someone explain something without knowing first what it is? No one would believe in someone without a proper and reasonable explanation with facts to assure their words. That's the way humanity and in a specific case the science community works.

Crystallography's field, as the name suggest, studies the “form” of “crystals”, and as a crystal could be any solid that presents a regular pattern of structure in their atoms, based on that structure, “their form”, you could explain many properties and get to know the object that you're studying from a more basic perspective. As an example of crystal structures there are many illustrations about different shapes of snowflakes, and they take those forms based on different conditions like humidity and temperature, based on their form you could get information about the conditions that made them.

With Röntgen's discovery of the X-Rays, followed by Von Laue's explanation about the diffraction of those rays on solids and other physicists, chemists and biologists that started to work in that field is that the “X-ray Crystallography” was born. In the TV sometimes you could see when someone takes a crystal like a diamond and shoots a ray



towards it and then the single ray is transformed into multiple rays that escape from the other faces of the crystal, X-ray Crystallography works with a similar idea, you send the X-rays towards something and based on how they turn after colliding with the object you could estimate its shape. Of course it's not magical, for too little things with not much of a symmetrical structure there are computers programmed to evaluate multiple possible forms. In the past, like when James Watson and company discovered the helix structure of DNA, they just get a plain 2D picture of a frozen cell, so they needed to explain the possible 3D structure that they imagine with math. Computers and other technologies make those works easier nowadays.

Thanks to the crystallography now we know the structural form of the information of a living being and their patterns, and we got to know many other structures, like virus, proteins and enzymes, and thanks to that medicine has evolved, science has evolved, and knowledge will keep evolving for sure.