

Triboluminescence

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1 Introduction

The phenomena is not understood fully, but appears to be caused by the separation and reunification of electrical charges. It seem to be very interesting and there are not enough researches to understand it, so I believe that my own measurements are quaint.

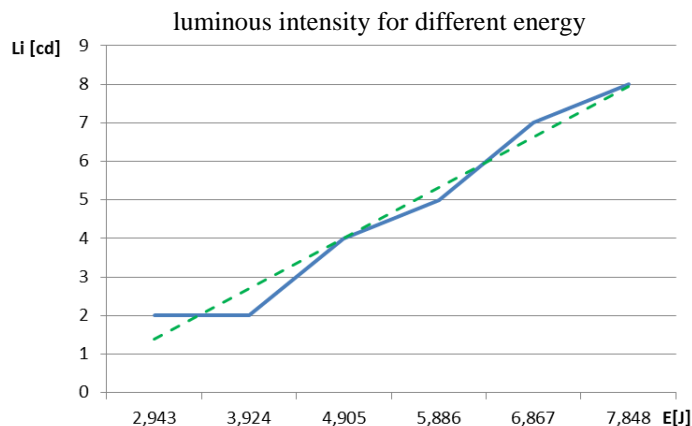
Triboluminescence is an optical phenomena which light is generated through the breaking of chemical bonds in a material when it is pulled apart, ripped, scratched, crushed, or rubbed.

2 Experimental part

A first method was taking photos with my camera of sugar in blender (all photos on the poster are my own). The photos are with ISO 6400 and long exposition (10s) in almost total darkness. Photos are also after graphic correction to fade in the effect. A second method was doing research with tube with counterweight inside, which hit the sample. Photoresistor can measure the light intensity. I built my own measurements set up, where I can compare results of different: samples, strike energy, temperature, air pressure or gases around.



My camera



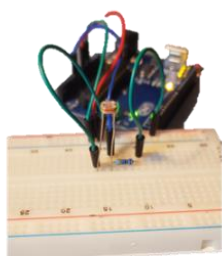
This graph above show how light intensity of sugar depends on the energy of hitting counterweight.



My photo of sugar in blender

3 Results

I made great photos of this phenomena in my house of different doses of sugar. I did measurements in my device and compare it with LED diode to know how many photons can there be, I am performing more experiments to have more data, because it can help me to understand this phenomena.



Arduino with photoresistor



Measurement tube

4 Conclusions

We can see triboluminescence of sugar in darkness, but it is hard to observe. When the hit force is bigger it shines brighter. For different materials the colour of triboluminescence is also different.

5 References

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