Adding Some Sparkle and Glow to Your Life

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While reviewing my course notes about food irradiation, I started thinking about how some members of the food science community used to joke about this creating foods that would glow in the dark. Of course, nothing could be further from the truth. Food irradiation is a safe and extremely effective way to combat food-borne diseases and enhance food safety. It can no more cause food to glow in the dark than dental X-rays can make your teeth "glow" or airport security X-ray units can make your luggage "glow".

I then began to wonder if there were any foods that actually did glow in the dark. With this thought nagging away at me, I did what anyone else would do - I went to the internet and starting "Googling". To my surprise there were a few hits that made for some interesting reading. However, I was now bitten by the bug and had to find out a few things for myself.

One of the articles told how you could make Jell-O ® glow in the dark. The author explained in great detail how various shaped moulds could be used. Once gelled, they could be turned out onto a glass plate with a flashlight shining up through them. Although creative and having good visual impact, this seemed like a bit of a stretch when it came to actually glowing in the dark.

Other articles related how tonic water could be used to make Jell-O glow in the dark if you placed the gelled dessert under an ultra-violet light source (commonly referred to as "black light"). The reason for this is that tonic water contains quinone (or quinine) which will fluoresce under UV light. There were even hints on the internet about making "glowing" ice cubes from tonic water and how to compensate for its distinctive taste.

After buying a two-litre bottle of tonic water and finding a UV bulb that would fit a standard light socket, I was able to see the pleasing bright blue glow in the darkened room. This was in striking contrast to plain old tap water which elicited no response.

One thing that really grabbed me from my reading was the claim that "Wint-O-Green Life Savers" ® would give off small flashes of light when you chewed them. Numerous sources gave instructions about standing in front of a mirror in a darkened bathroom and biting down on the unsuspecting candy. After a couple of unsuccessful attempts and some concern about the well-being of my teeth, I shelved this idea as well as the remaining nearly-full bag of Life Savers. Then I hit upon another plan ("hit" being the operative word here).

Late one night, I went out to the garage and lined-up three or four of the wintergreen

candies on the concrete floor. I brought our daughter along to act as a witness to my folly. After turning out the lights and allowing our eyes to adjust to the darkness, I gave the first candy a sharp rap with a hammer. To my delight, there was a bluish-green spark of light at the moment the blow struck its target. This was repeated several more times - each time with the same results. Upon reporting the results to my wife, our daughter commented that not only did the candies emit light when hit with the hammer, but “Dad cackled with glee” each and every time. She also commented that the garage had a really nice smell after our shattering experiment. (Just for the record, I don’t really “cackle”, but it was quite impressive.)

For those of you wondering about the actual cause of the sparks of light, the answer lies in reactions at the atomic and sub-atomic levels. Basically, the crushing action of your teeth, or a hammer, creates enough energy to force some electrons out of their orbits within the sugar crystals that make up the hard candies. According to various sources, when these released electrons meet nitrogen molecules in the air, they give their extra energy to the nitrogen atoms. The nitrogen atoms then emit light in order to get rid of this unwanted energy, which we see as the bluish-green sparks. The presence of oil of wintergreen helps create a favourable environment for all this to take place.

If you do try this at home, you may want to wear some safety glasses to protect yourself against flying bits of candy. Also, be careful not to hit your fingers if you are wielding a hammer in the dark.

Tonic water (on the left) glows under ultra-violet light while plain tap water (on the right) does not.