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Team First Report

MCEN 4151-001

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Flame from Cologne

This photo was our first team assignment which was intended to allow us to shoot fluid photos with the help of a team. I decided to shoot a fast-moving flame with the help of my team member, Shalil Jain. The idea was to capture a flame that was in mid combustion and to slow down the movement of the combustion into a still image. The flame was produced from a cologne spray bottle which was purchased at Walmart. Shalil and I set up a candle outside as the source of the first so we could safely repeat the experiment. While the candle was lit, the cologne was sprayed right over the candle, igniting with the surrounding air and creating a small fireball for less than a second. The set up for the image is shown below.

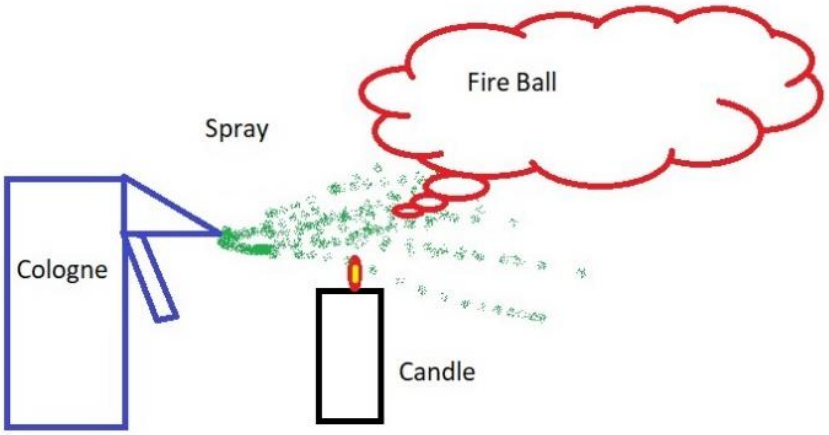

Figure 1: The set up to capture the fireball image.

The fireball is made from the alcohol(Ethanol) which is contained inside the cologne. Using the alcohol as a fuel for a flame, when the candle acts as an energy and there is an excessive amount of oxygen surrounding the alcohol spray, it ignites and leaves carbon dioxide and water.

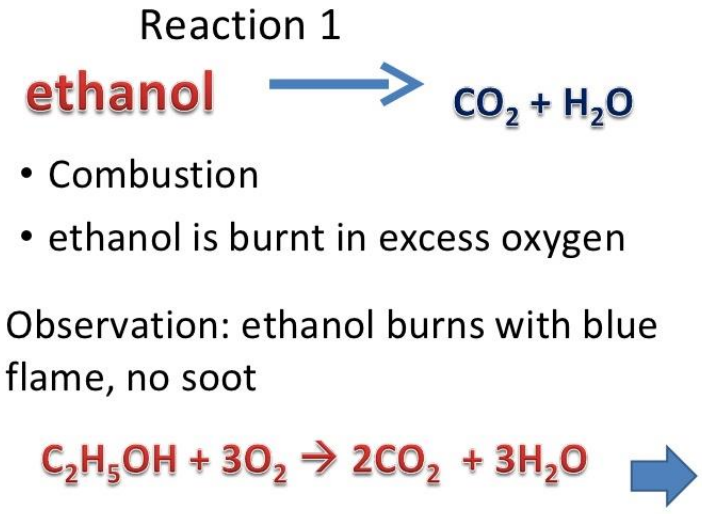

Figure 2: The governing equation for alcohol and why it ignites.

The flame we captured was more of a red-yellow color, and this was due to the fact that our flame was burning at a higher temperature than just straight ethanol.

The visualization technique used in this photo to was to isolate the flame in the captured photo, and this was accomplished by taking it at night outside so the entire background would be black. The flame was what produced the light at night therefore making it easy to capture with the camera.

The photograph technique in the photo was to shoot it at a very fast shutter speed. We achieved this using a Nikon D3400 with a shutter speed of 1/4000 of a second, and maxing out our iso at 25600, along with an aperture f/5.6 18mm. The dimensions of the original photo was 6000x 4000 pixels. Many flames were taken over the course of several mins, and over 300 images were shot, as Shalil was continuously spraying the bottle I just clicked away at the shutter after setting my focus on the flame. The post editing of the image was done using a photo editing software offered by Hp, and the only thing that was changed was the exposure and intensifying the colors. This was to make the colors pop out more and give the flame more of an intense red.

The image shows a high-speed fireball which is shot at an incredibly fast shutter speed to capture something that can barely be seen by the naked eye, and makes it visible. The path of the fireball is shown in a still image and it's beautiful to see the flame taking the shape of the spray pattern. Something to improve on for the next time we shoot a shot like this would be to set the camera further back so we could capture the entire fireball. Not only that but I would also try to instead get a slow-motion video of the combustion of the ethanol so we can see the entire movement and combustion pattern of the fireball. Another thing I would like to try is to have the spray be going towards a nonflammable object so we can see how the flame interacts with it, using proper safety precautions of course.

Sources:

MRSMPC Follow. “Revision on Alcohol,Carboxylic Acid and Ester.” *LinkedIn SlideShare*, 8 Mar. 2011, www.slideshare.net/nazimah55/revision-on-alcoholcarboxylic-acid-and-ester.