

SAFETY

# A tale of 2 explosions

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The elephant in the boom



Credit: Nick Uhas

Foam is where the heart is: Two famed YouTubers and their colleagues claim they set the world record for largest elephant toothpaste experiment.

**I**n 2019, the most-viewed video on TikTok—a short-form mobile video platform—was a chemistry experiment: a massive demonstration of the hydrogen peroxide–potassium iodide reaction known as elephant toothpaste. To date, the 12 s video of four mad scientists in David Dobrik’s backyard pouring four buckets of a mysterious yellow fluid into a giant test tube of blood-red liquid has 183.7 million views on TikTok. The yellow fluid, of course, was potassium iodide, the catalyst that rapidly decomposes hydrogen peroxide. In the video, the potassium iodide was added to a mixture of hydrogen peroxide, water, soap, and red food coloring to create water, iodine, and oxygen gas, which gets trapped in the soap to create the characteristic foamy eruption.

With that TikTok, Dobrik and Nick Uhas, another scientific social media maven, set out to make a world record for the amount of foam produced from an elephant toothpaste experiment. However, after the video went viral, there was social media controversy about the legitimacy of the record-breaking eruption. So, for their next attempt, the duo committed to quadruple the (approximately)  $67.5 \text{ m}^3$  of foam produced in the viral TikTok clip.

In a video with over 22 million views on YouTube, the scientists put a whopping 625 L of 35% hydrogen peroxide (in addition to the soap, water, and food coloring) in a 1,893 L plastic drum. They then rigged a pulley system, which involved placing a trash can on top of a lifeguard chair, to efficiently dump the 91 L of potassium iodide catalyst into the drum. In the video, a dramatic exothermic reaction is shown, producing approximately  $200 \text{ m}^3$  of foam.

It might look cool, but the Newscripts gang felt compelled to consult some safety experts. “I am familiar with this stupidity,” David Katz, a chemistry educator and demonstrator, tells Newscripts. He says that the 35% hydrogen peroxide can cause severe burns.

Furthermore, “the blobs of foam seen floating down the valley could contain unreacted hydrogen peroxide,” which could hurt innocent bystanders, says Sandra Koster, a retired senior lecturer from the University of Wisconsin–La Crosse.

Yikes! Want to try an elephant toothpaste experiment at home? Stick with the safer 3% hydrogen peroxide you can buy at the drugstore. While yeast won't produce the same dramatic explosion, using that as a catalyst will lead to a slower buildup of foam and be less likely to permanently stain walls. And always, always, always use personal protective equipment.