



NSTA SAFETY ALERT

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NSTA Urges Science Educators to Halt the Use of Methanol-Based Flame Tests on Open Laboratory Desks

Safer alternatives to methanol-based flame tests are available and should be used

ARLINGTON, Va.—November 4, 2015—Responding to serious safety issues surrounding science experiments and demonstrations involving ignition of flammable liquids, the National Science Teachers Association (NSTA) strongly recommends that teachers immediately halt the use of methanol-based flame tests on an open laboratory desk.

When carried out on open laboratory desks (outside of a chemical hood) these demonstrations present a high risk level for flash fires and deflagrations that can cause serious injuries to students and teachers. On an open laboratory desk, invisible flammable vapors can be ignited by a flame, a spark (including static electricity), or a hot surface. Teachers who conduct these types of demonstrations outside of a fume hood put themselves and their students at unnecessary and serious risk during this demonstration.

Teachers need to seek out safer alternative laboratory investigations and demonstrations that minimize and reduce potential injury to students and teachers. In order to select safer alternatives, teachers need to have a thorough and current understanding of safer laboratory practices and perform hazards analyses and risks assessments of science investigations prior to conducting them.

If demonstrations involving methanol-based flame tests are to be done, they should be handled only under a fume hood. This, however, still presents some level of risk. [Safer alternatives](#) to using flammable liquids for flame tests are available and should be considered to make it as safe as possible for students and teachers. Appropriate resources such as safety data sheets also need to be reviewed as part of the hazards analyses.

Media reports have drawn attention to injuries that have occurred to students and teachers when methanol is ignited to show how different substances produce flames of different colors based on their varying properties. The experiment, referred to as the “rainbow” demonstration, is visually exciting but dangerous when conducted outside a fume hood. The U.S. Chemical Safety and Investigation Board (CSB), an independent federal agency, released a [safety video message](#) featuring a burn victim from the rainbow experiment in 2006. The video emphasized that the incident was preventable, but practices to make it safer were not followed. The American Chemical Society (ACS) Committee on Chemical Safety also recommends that the “rainbow” demonstration on open benches not be used in science classrooms ([ACS 2014](#)).

NSTA has a number of safety resources available to teachers, including a recently released position statement [Safety and School Science Instruction](#) (NSTA 2015). NSTA recommends that teachers and school leaders seek out these resources on the [NSTA Safety Portal](#). Many of the resources on the portal are developed by the NSTA Science Safety Advisory Board. This Board advises the NSTA leadership on issues related to science safety and the NSTA staff on safety guidelines for demonstrations and workshops at all NSTA activities. The Advisory Board is comprised of a chairperson appointed by NSTA leadership, an NSTA district director, and nine appointees.

About NSTA

The Arlington, VA-based [National Science Teachers Association](#) (NSTA) is the largest professional organization in the world promoting excellence and innovation in science teaching and learning for all. NSTA’s current membership includes approximately 55,000 science teachers, science supervisors, administrators, scientists, business and industry representatives, and others involved in science education.

References

American Chemical Society (ACS). 2014. Safety Alert Rainbow Demonstration

National Science Teachers Association (NSTA). 2015. *NSTA Position Statement: Safety and School Science Instruction*.

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