

Stoichiometry - Limiting Reactant Prop (#7)

Limiting reactant demonstration (1)

MATERIALS

- Cotton Balls
- Gun cotton (nitrated cellulose)
- Large watch glass or crystallization dish
- Long bbq lighter
- Squirt bottle full of water

PRESENTATION

- Place a cotton ball onto the watch glass and light with a lighter. Do this twice.
- Place a similarly sized piece of gun cotton on the watch glass and light with a lighter.

DISCUSSION

- Igniting the cotton ball (a fuel) at about STP, there is an incomplete combustion. There is smoke emitted and residue left behind. The limiting reactant in this case is oxygen.
- Ignition of the gun cotton produces a bright yellow flash with no smoke and no residue (if made properly and not aged). This shows the effect of having essentially no limiting reactants.

A little history of nitrocellulose can be included with this demonstration (why movie film reels used to burn up, decompose, etc.)

HAZARDS

Nitrocellulose combusts somewhat rapidly although not explosively @ STP. Do not use a piece larger than the size of a cotton ball and start with a piece considerably smaller to gauge it's performance.

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http://www.chem.arizona.edu/lecture_demos/limiting_reactant

Links:

[1] <http://www.chem.arizona.edu/taxonomy/term/11>