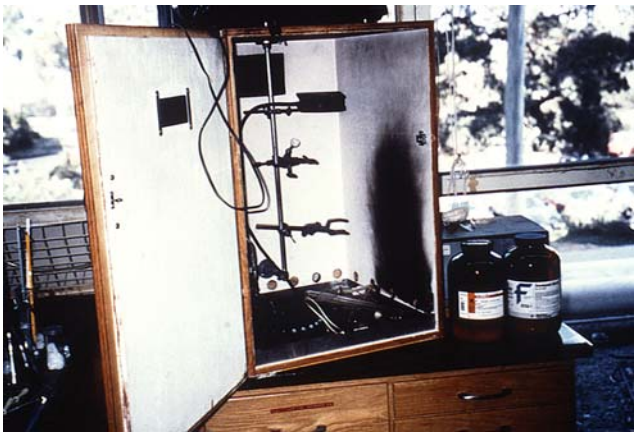
Accident Summary: Flash Fire from Loss of Cooling Water

In the mid-1990's a campus lab requested that a plumber come to repair a leaking faucet. Upon arrival the plumber asked the lab personnel present if it was alright to shut off the water to the whole lab while he worked. They gave their approval. However, the lab personnel did not know, or forgot, that another lab member had started a UV-photolysis of a solvent-containing reaction in a closed box. The photolysis required constant cooling water flow to prevent the apparatus from over-heating.

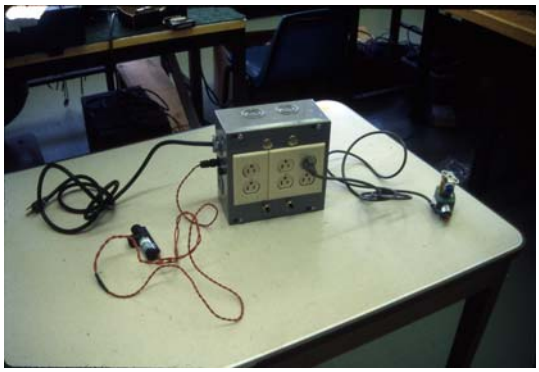
After a few minutes with no cooling water flow, the organic solvent burst into flames and began to spread to the wooden box. Fortunately, the plumber – now alone – quickly extinguished the blaze with the lab's fire extinguisher.



Unlabeled wooden UV-photolysis box showing evidence of fire.

Lessons Learned: The photolysis box was not labeled in any way. It should have been prominently labeled something like this: "UV PHOTOLYSIS IN PROGRESS. TO PREVENT FIRE, FLOW OF COOLING WATER ESSENTIAL." The researcher's name and a date should also have been included on the sign.

There are other apparatus, e.g. solvent stills, that require constant cooling to prevent fire, or damage to equipment. There is always the possibility of loss of building water pressure due to earthquake, plumbing failure, or inadvertent manual shutoff, etc. There are devices available which monitor water flow rates and automatically shut off electrical power to an electrical outlet if the flow rate drops below a pre-programmed rate. These simple devices are commercially-available and are currently available from the UCSB Chemistry Department electronics shop – picture below.



Example of water-flow measuring device with automatic electrical power shutoff.