



Bunsen Burner Safety

We recently had a query concerning the possible formation of carbon monoxide from Bunsen burners with their air-holes closed. The following notes are based on information supplied by the Research and Development Division of British Gas, and may be of interest to members.

A free-burning gas flame, even if luminous as a result of lack of primary aeration, will not produce more than the slightest trace of carbon monoxide. The amount of carbon monoxide formed from fifteen to twenty Bunsen burners simultaneously operating under these conditions in a school laboratory would be harmless. In fact, the yellowness of the flame does not indicate that combustion is incomplete; it simply shows that, with little or no primary air, carbon particles are formed as an intermediate product and these become visible when they are heated to incandescence as they oxidise. In a free-burning flame the oxidation to carbon dioxide is virtually complete.

If, however, the Bunsen flame were left under a retort stand, then flames could be partially quenched by playing on to a relatively cool surface. Under these conditions, particularly if the flame is playing on a wire gauze, it is possible to produce very considerable quantities of carbon monoxide, and under-aeration of the flame will exacerbate this.

The most sensible procedure is therefore for pupils to remove the burner from whatever was being heated, close the air-hole, and then turn the flame down to as low a rate as possible whilst retaining luminosity. This is probably less dangerous, and certainly less disruptive, than expecting pupils to re-light the burner each time it is required.