Safety in Use of Alkalis in Science Experiments

(Extracted from the School Science Newsletter No. 44)

Alkalis such as sodium hydroxide and potassium hydroxide are commonly used in experiments in science courses of secondary schools. Both of these substances are highly corrosive in the solid form. In solutions, they are classed as corrosive or irritant depending on their concentrations. In the past, sodium and potassium hydroxide solutions of 1.0 M or above are classed as corrosive whereas solutions of 0.5 - 1.0 M are classed as irritant according to the UK Regulations and ECC Directives. Recently, sodium and potassium hydroxide solutions are re-classed as corrosive down to 0.5 M, and irritant if 0.2-0.5 M. Note

Alkalis cause severe and rapid burn on skin contact, and the extent of damage depends on the duration of contact. Alkalis in the eyes are much more dangerous than acids of comparable concentration. They cause severe eye damage rapidly and permanent corneal damage may result.

Whereas even sulphuric acid is classed as corrosive only down to 1.5 M, it would seem necessary to be more cautious in handling sodium and potassium hydroxides. The general safety precautions required for handling corrosive substances should be observed. Safety spectacles must be put on during experiments involving the use of these corrosive substances - in fact it is always good practice to wear safety spectacles whenever science experiments are performed. Pupils should be warned of the hazardous nature of the alkalis by using appropriate warning symbols affixed on the reagent bottles. In handling solid alkalis or their concentrated solutions, rubber gloves should be used as a means of protection.

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In case of skin contact with alkalis, the affected area should be immediately flushed with water for at least 30 minutes. For eye contacts, rinse the eye immediately under running water and open the eyelid to facilitate irrigation. Call for medical attention at once and continue rinsing until the medical personnel arrives. All eye injuries should be treated as serious and medical consultation be sought.

To help prevent permanent damage to the eye, it would be desirable if, for routine laboratory use, alkali concentrations were kept a little below 0.5 M. Nearly all the common practical activities will work just as well with, say, 0.4 M, as with 1 M or 2 M solutions. Clearly, if alkali concentrations are lowered it might well be sensible to make comparable reductions in the concentrations of other reagents in reacting.

*(**Note:** Source from Education in Science (September 1996), The Association for Science Education, UK)*