

Solid oxidising agents

We recently heard of a violent reaction when a student added water to a mixture of solid potassium iodate(V) (KIO_3) and sodium disulphate(IV) (metabisulphite, $\text{Na}_2\text{S}_2\text{O}_5$). The instructions required the aqueous solutions to be mixed, which would have been safe.

There are many dangerously violent reactions known between solid oxidising and reducing agents (often powdered metals with oxides or oxo-acid salts). These can sometimes be initiated very easily: often by a few drops of water, or even by friction. A brief list appears in section 15.7 of the ninth edition* of Safeguards in the School Laboratory. Mistakes will be made from time to time (as reported above), which is why it is important to wear eye protection whenever chemicals are handled. However, it is best to try to minimise the possibility of mistakes, for example by not having solid oxidising and reducing agents available at the same time.

*A list of some mixtures that should not be made (mostly oxidiser/reducer mixtures) appears in Section 15.8 of the 11th (current) edition of Safeguards in the School Laboratory (ASE 2006).