

Correspondence

Unexpected Exothermic Reaction between Thioacetic Acid and DMSO

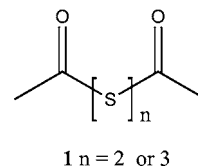
To the Editor:

We take this opportunity to warn and inform your readers about an unusual reaction we have observed during the course of our research and the potential exotherm dangers associated with it.

When dimethylsulphoxide (DMSO) and thioacetic acid are mixed (20 mL of each, 1 mol equiv), the reaction exotherms from room temperature to a reflux of 98 °C in 6 s. By approximating both materials to have the same specific heat capacity as DMSO, this equates to approximately 2700 J mol⁻¹. Thankfully, good laboratory practice prevented any serious incident; however, there is the potential for a major incident.

This reaction is also unusual in that elemental sulphur (S₈) is produced as a major product and in high purity, together with dimethyl sulfide (DMS), based on ¹³C NMR data and “olfactory evidenc”. Further GC–MS data show *m/z* ions for S₈ and DMS together with ions at *m/z* 151 and 183, which could be diacetyl-di- and tri- sulphides (i.e., of type **1**) or a substance with a similar formula. These observations may well shed some light on the mechanism of the process. It is well-known that DMSO is readily activated by a wide variety of electrophiles and strong acids,¹ an application of which is the frequently used oxidation

reactions based on DMSO;² however, we are unaware of a directly analogous process, with the exception of studies by Swern.² As well as making colleagues aware of the potential dangers presented by this highly exothermic reaction, we would be interested to hear if anyone has come across a related process. (Experimental and analytical data are available for interested parties.)



Yours sincerely,
Dr. Andy Whiting and Mr. Simon Walton

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(1) Epstein, W. W.; Sweat, F. W. *Chem. Rev.* **1967**, 67, 247–260.

(2) Mancuso, A. J.; Swern, D. *Synthesis* **1980**, 3, 165–85 and references therein.