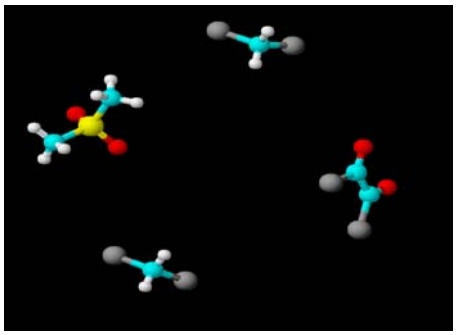
Rapid Screening Device - RSD™
Technical Application Note 106
Sample Data: The Swern Reagent
Cryogenic Testing

Introduction

DMSO, dimethylsulfoxide is widely employed as an oxidant, notably in the transformation of primary alcohols into aldehydes. The Swern reagent is formed by reaction of DMSO with oxalyl chloride.and all reactions are carried out at cryogenic temperatures as the reagent is know to explode at room temperature. Production and reaction or decomposition of the Swern reagent is ideal for showing the operation of the Cryogenic option of the RSD.

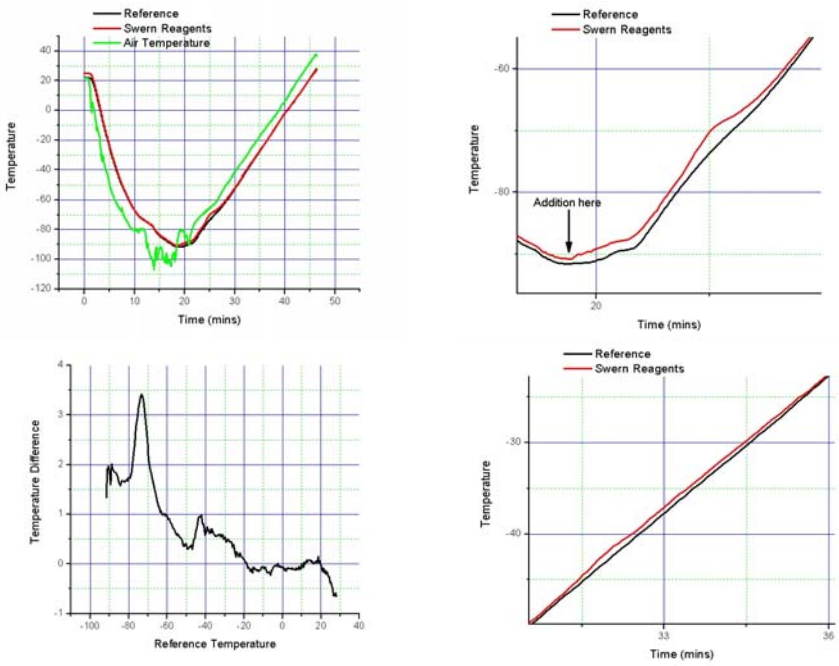


Experimental

The Swern reagent is made in low concentrations and these were repeated here. 3ml of 1.49mmol oxalyl chloride in dichloromethane. The sample was held in an ARC-bomb and cooled to –90°C. The sample container placed in the RSD and the system cooled utilising its cryogenic option. This was done to –90°C and then 0.7ml of pre-cooled DMSO in dichloromethane at a concentration of 2.98 mmol was added. The test was started immediately. The conditions being 5°C/ min heating. Pressure was not measured.

Results

The test proceeded according to the program and two exotherms were seen. However these were of low energy release. The test indicated that further experimentation was required at higher concentration.



Data Plots from the Preliminary Swern Reagent Test

thermal hazard technology