



Analysing Endotherms using Atlas

1 Summary

This application note shows how atlas and reaction monitoring can be used to look at endothermic processes.

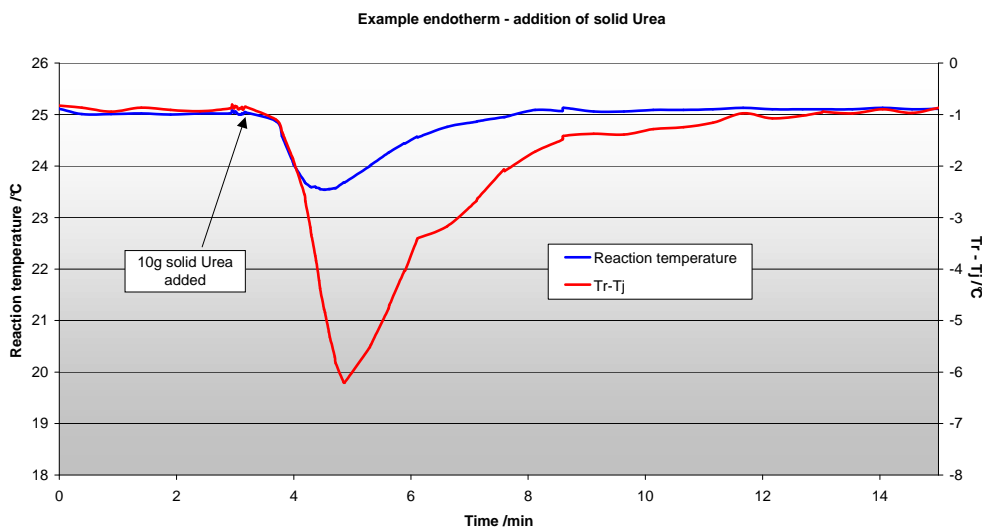
2 Experimental

Atlas was set-up with a 500ml jacketed reactor, scorpion stirrer system with propellor blade, an oil-drain unit (together with temperature nodes and RTDs), three temperature nodes (with triple node socket) and a Julabo recirculating heater/chiller (controlled by the atlas base).

The Atlas system was set-up and connected to the circulator. 300ml of water was added to the reactor and was set to heat to 25°C. Once the temperature was stable (ca. 20 minutes) 10g of solid urea was added (as a single dose) into the reactor. The temperature responses were recorded in a .csv on the Atlas base unit and downloaded (using a standard USB key) to PC for later analysis.

3 Results

The solid dissolution can be clearly seen in both the reaction temperature and $T_{\text{reactor}} - T_{\text{jacket}}$ curves above. The main advantage of the reaction monitoring ($T_{\text{reactor}} - T_{\text{jacket}}$) is the larger signal, making smaller enthalpy processes easier to detect and quantify.



4 Conclusions

Atlas reaction monitoring is an easy way to detect whether processes are exothermic, endothermic or enthalpy neutral. The ease of set-up, short equilibration time and stand alone operation make this system ideal for use in any process chemistry laboratory.