



## Heating on an atlas hotplate

### 1 Summary

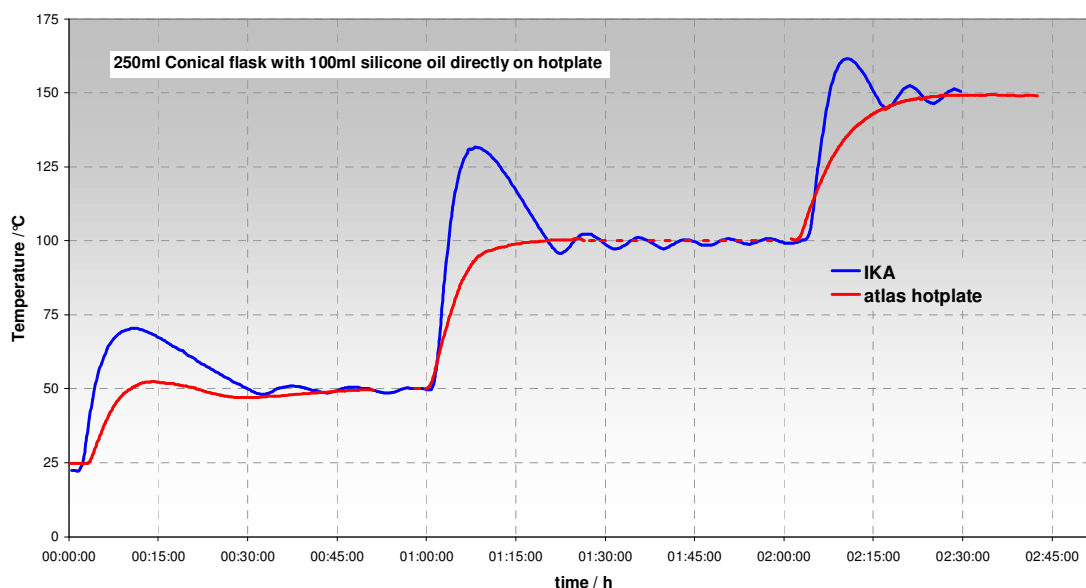
The heating of a solution on a hotplate is something taken for granted by most chemists, whether in an oil bath, direct on a hotplate or using a solid-state heating bath. The atlas system from Syrris has improved algorithms for heating to ensure that the temperature set on the front panel is achieved rapidly and accurately but without overheating the system.

In the following of these experiments, an external thermocouple probe has been used with the system to accurately measure reaction temperature (as shown right).



### 2 Comparison to traditional systems

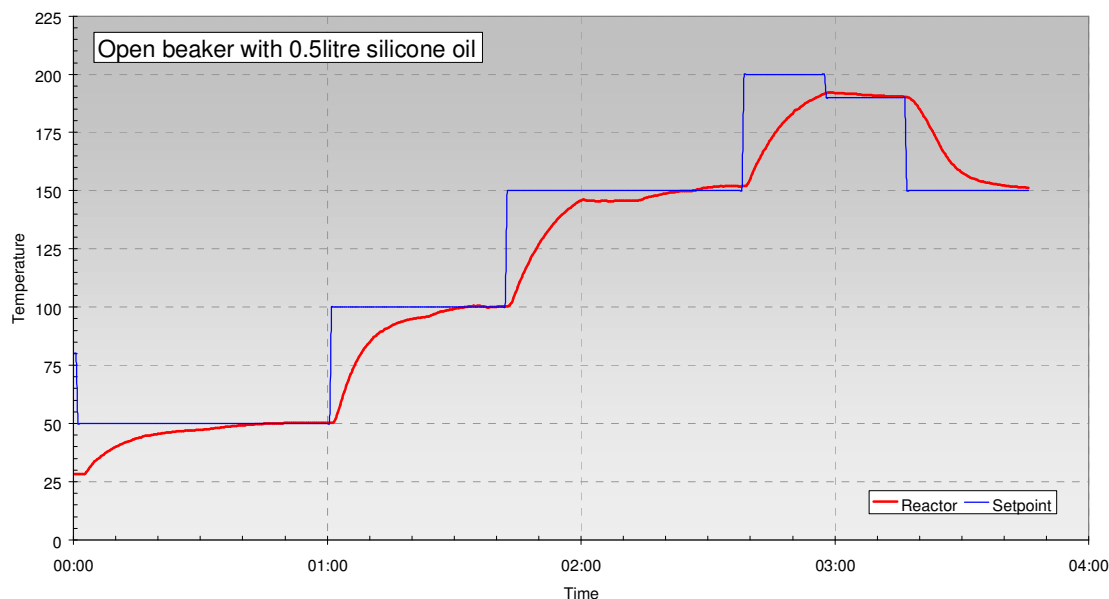
The performance of the atlas was assessed against a standard laboratory hotplate. Both systems were used with an external thermocouple and with a flask placed directly on the hotplate to ensure that a fair comparison was made. The dotted line shows where data was extended to plot the two charts on the same axis.





### 3 Heating on an open hotplate

Experiment 2 shows the heating of a large volume of silicone oil on a hotplate in an open beaker.



### 4 Heating with a dry bath

The atlas system is designed to work with a dry-bath heating system to avoid the need for messy and dangerous oil-baths. There are two versions available; a single stacking dry-bath (for round bottom flasks of 50ml to 1litre) and a triple dry-bath (for up to 3 flasks of 50ml to 250ml).

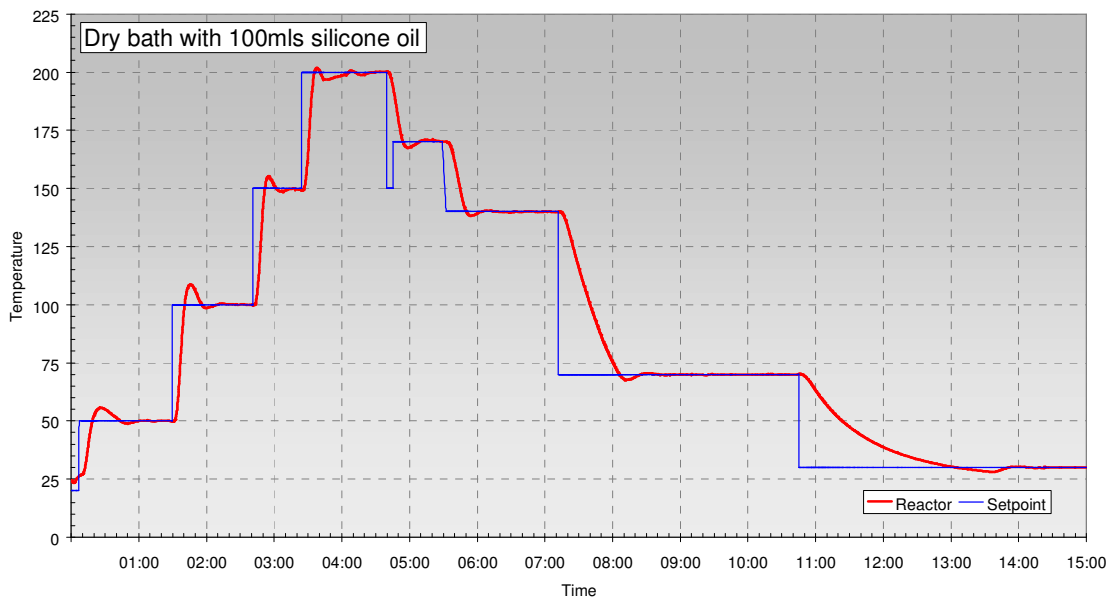


Single stacking drybath

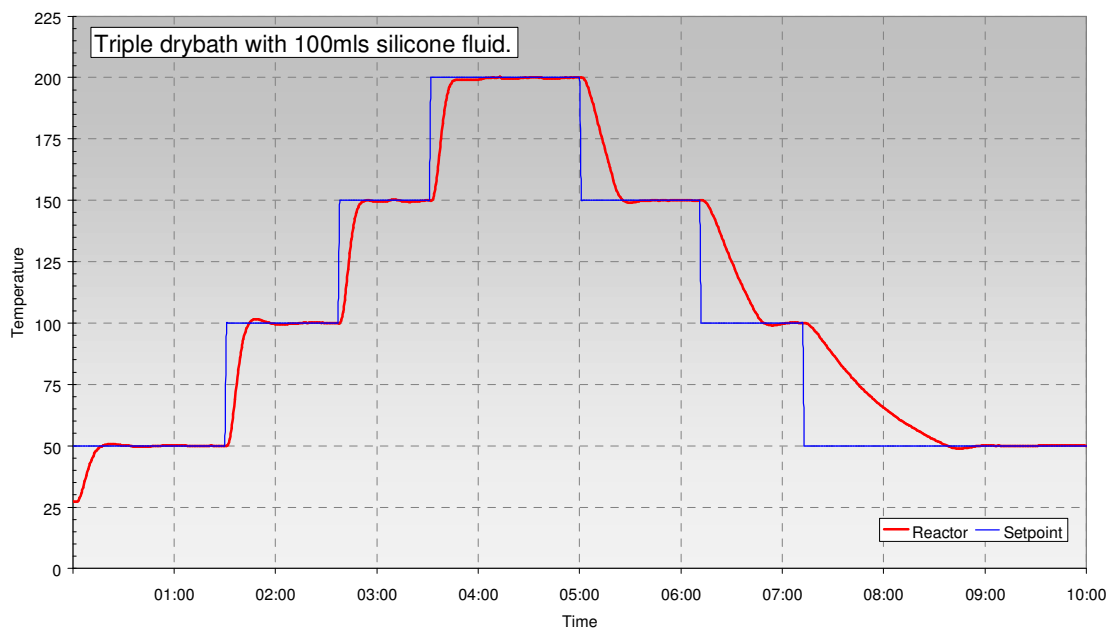


Triple stacking drybath

Graphs showing actual temperature and set-point are shown for the single and triple versions.



Experiment 4 (below) shows the triple dry-bath has a lower mass and therefore performs slightly better than the single dry-bath however both give rapid, accurate temperature control with minimal overshoot.



## 5 Conclusions

The atlas system gives excellent control of solution temperature when heating with the hotplate. The novel control algorithms employed by the atlas system allow rapid heating with minimal overshoot, using either the hotplate directly or with a dry bath.



**atlas** heating a solution  
in a single dry-bath