Unistat® 1005w

Cooling an Asahi 10-litre triple wall reactor to -110 °C

Requirement
Temperatures required to carry out chemistry in specialised cryogenic research have become lower and lower. This case study demonstrates that the process temperature inside an Asahi vacuum insulated glass reactor can be comfortably cooled and controlled at -110 °C by using a Unistat 1005w.

Method
The Asahi reactor was connected to the Unistat 1005w using two 1.5-metre insulated metal hoses. Under process control, a process set-point of -110 °C was entered and the results recorded using the Huber "SpyControl".

Results
The jacket temperature cools quickly in a linear fashion to -100 °C in approximately 55 minutes ramp rate of 2 K/min) before slow.

Setup details

Temperature range:	-120...100 °C
Cooling power:	1.5 kW @ 100…-40 °C 1.4 kW @ -60… -80 °C 1.0 kW @ -100°C
Heating power:	2.0 kW
Hoses:	2 x1.5 m; M30x1.5 (#6386)
HTF:	Kryothermal S
Reactor:	10-litre insulated jacketed glass reactor
Reactor content:	10 litre M90.055.03
Stirrer speed:	~ 200 rpm
Control:	process