H W S Labortechnik

Entwicklung und Fertigung

Laborkomponenten
und -systeme aus Glas,
Metall und Kunststoff

Meß- und Regeltechnik
Laborelektronik

**HWS-Coolsystem
with 2 ltr.
Reaktionvessel**

H W S COOLGAS - System for reaction vessel from -160°C to +200 °C

H W S Labortechnik

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www.HWS-Mainz.de

Coolgas system
HWS – COGA'N'

Based on the deep temperature of liquid nitrogen and ist high cooling capacity a powerful cooling system has been developped.

The liquid nitrogen in a cryocontainer is evaporated by a heater 'jet' resulting a constant extremly cold gas stream (flow).

By variation of the heating the cooling and the gas stream is influenced to rduce the consumption of liquid nitrogen to a minimum.

The gas fed coming from the reservoir is transferred via a vacuum insulated pipeline to the reaction vessel. At that position a heater in combination with a PT 100 produces a defined gas stream with an adjusted temperature. The energie exchange can be performed either directly (metal coil inside vessel) or indirectly (jacketed reactor).

Indirect: The coolgas is guided through a mantle of a reactor, cooling the media inside the vessel.

Direct: The coolgas is guided through a stainless steel coil which is inside the medium. This guarantees a transfer of cooling with a minimum of loss of energy.

In both cases a rapid coling can be performed, as the system produces a gas stream of -170 °C.

In spite of the relative bad energy exchange of gas compared to liquids a very fast cooling (see picture) can be achieved.

If the final temperature is reached a stability of +/- 0,1 °C can be performed by a cascade controller.

A large advantage of the HWS coolgas system is the modular construction.

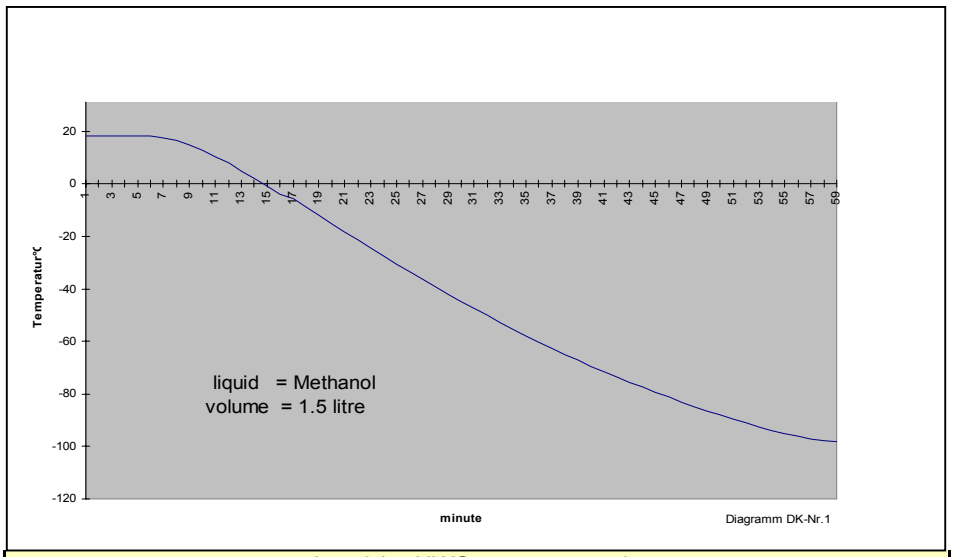
An exchange of modules can influence the velocity of cooling, the volume of the reactor, the execution of the cover.

However each system consist of:
N2 - reservoir, heater, vacuum pump, controller, reactor and cover.

As N2 is used each cleaning of the reactor is limited only to the inner of the reactor.

As N2 is inert no hazardous products causes problems for the environment.

sample:



In a 2 ltr. HWS reactor vessel
1,5 l methanol are cooled
within 60 min +20°C to -95°C.
The consumption of nitrogen is
5 -6 litre. To keep the media
at -95°C a volume of 1,2 litre
per hour ist needed