



## PELTIER DEVICES OR CIRCULATING BATHS FOR CD MELTING EXPERIMENTS?

When purchasing a new Circular Dichroism spectropolarimeter the open choice is typically which type of thermostating system should be used with. Today Peltier types are probably the most popular, since simple to use and much faster, particularly in the cooling down phase. However we would like with this memo to stress a few points in favour of the classical external bath approach.

Jasco J-810 can be supplied with software (JWTC-484) which includes drivers able to control the different Peltier accessories available and a few Neslab® baths. Today the bath of choice is the model RTE-111D (cheaper than RTE-111M and with no redundant features) that offers an ample temperature range (-25 ~ 150°C).

This bath offers easy connection to a remote Pt-100 probe (not provided as standard and not to be bought from Neslab, since cheaper sources are easily available!) so there is the choice to insert a suitable probe either in the sample directly or in contact with the cell holder.

Software offers the selection to use internal or external probe at user choice.

The advantages of the bath versus any Peltier accessory are:

-low cost

-wider temperature range

-possibility to use same bath on other instruments

-possibility to thermostat also cylindrical cells (newcomers may not know, but in the not too far past cylindrical cells were a sort of must in CD spectroscopy. Reasons of their choice are still there.... less birefringence = less artefacts, shorter path in a sealed form, better lightthrough since no beam vignetting....). It's very true that modern data processing allow simple baseline correction ....., but less correction you apply ...more reliable is your data.

Today rectangular cells are the typical choice, since cheaper and calling for reduced sample volume. Thermostating of rectangular cells is also easier, at least in the 1-10 mm pathlength range.

Considering melting experiments it's also very true that 10mm path rectangular cells allow to stir the sample with a small magnet: this reduces in cell thermal gradients, but every time you must work with reduced paths, this advantage is lost.

-possibility to use cylindrical jacketed cells, very expensive, but probably still the best way to thermostat

-capability to regulate temperature of other accessories, such as stopped-flow cells, which equip the same unit.

Conclusion:

-Peltier accessories are very convenient to use and are highly recommended where a large workload of melting experiments is expected

-Bath is still the best choice where versatility is required

Further suggestions:

-if your choice is for a Peltier device pls consider from the beginning if simultaneous fluorescence measurement or FDCD (fluorescence detected circular dichroism) capabilities will be required later on. Both these facilities call for a Peltier with 90° optical port. So select the proper Jasco Peltier accessory from the beginning: field retrofit would be very expensive.

-for more information on the Neslab baths pls go to the web: [www.neslabinstruments.com](http://www.neslabinstruments.com)