



CD & SIMULTANEOUS FLUORESCENCE DETECTION

It's a current trend to deliver in these days CD spectropolarimeters equipped with a second photomultiplier tube for simultaneous fluorescence detection.

The second PM tube is usually placed at 90° and it collects the total fluorescence via a lens, while long pass filters assure that elastic scattering is not detected.

More sophisticated approaches may use emission monochromator in place of the filters.

The Jasco CDF-426 for J-810 is a nice example of the current capabilities. It includes a Peltier cell holder for transmission/fluorescence and a second PM tube with integral H.T. supply and preamplifier to feed the Ext2 input of the main unit. In this mode fluorescence is detected at same time than CD (and regular absorption), which will save a lot of time during melting experiments, particularly when using the optional JMWTC-487 multi-wavelength variable temperature measuring program available from Jasco.

Fluorescence sensitivity itself may be software adjusted simply changing the H.T. applied.

We want to outline here the possibility to get a different Peltier accessory (Model PFD-425, originally designed for FDCD, fluorescence detected circular dichroism), which has same design, but which is not including the second PM tube.

In our opinion this accessory may be very convenient in a few cases, since E.C.S. can supply not a single, one, but a full choice of PM tubes with which to measure fluorescence:

-H-5784-04 multialkali type with response from below 200 to 850 nm

-H-5784-03 bialkali type with more limited range (up to 650 nm), but more sensitivity

-H-5784-02 multialkali type, limited to 300 nm, but with far better sensitivity toward the NIR and range extended to 880 nm

Even the mounting is different, we include a focusing lens to increase sensitivity and additionally the E.C.S. tubes can be placed in place of the standard PM tube allowing intensity fluorescence correction in FDCD mode as from Technical Report N° 6; this obviously doesn't apply to H-5784-02 which has no UV capabilities.

Another advantage of the E.C.S. mounting is the possibility to use simply the second P.M. tube also for fluorescence measurements when using Bio-Logic stopped-flow cells, which for a dedicated adapter can be provided.

Furthermore the standard design can be easily changed to fit other photomultiplier tubes at customer choice.

For example the current availability of Peltier cooled photon counting heads would be of particular interest when sensitivity is of major concern: this would raise the cost substantially, but it'd allow ultra high sensitivity fluorescence measurements using the low stray-light excitation of the double prism monochromator.

Conclusion:

the standard CDF-426 is by sure a suitable choice, but the PFD-425 + E.C.S. mounted second PM tube may represent a logical alternative for not current applications.

Note:

the E.C.S. second PM tube is compatible also with our own design water circulation CD/fluorescence cell holder, obviously cheaper than the PFD-425.