

One-Drop CD spectra measurements of organic compounds and metal-complexes using a microsampling disc

Introduction

While CD measurements are typically obtained to analyse the secondary structure of proteins, CD can also be used to determine the configuration of organic compounds and coordination of metal complexes with optically active ligands.

This application note will compare CD spectra obtained with the One-Drop microsampling disk and a conventional cell for organic compounds with an absorption band in the ultraviolet (UV) region and metal complexes with an absorption band in the UV-Visible region.

Keywords

One-Drop measurement, microsampling disk, circular dichroism, organic compounds, metal complexes, J-1500

Experimental



JASCO J-1500 CD spectrometer
View product information at www.jascoinc.com

Measurement conditions for organic compounds (Figure 1)
J-1500 CD spectrometer, MSD, conventional cell

| | |
|---------------------------|---|
| Spectral bandwidth | 1 nm |
| Accumulation | 4 times (MSD), 1 time (conventional cell) |
| Data acquisition interval | 0.1 nm |
| Response time | 2 seconds |
| Scan speed | 100 nm/min |
| Sample volume | 10 μ L (MSD), 400 μ L (conventional cell) |
| Path length | 1 mm |

| Measurement conditions for metal complexes (Figure 2) J-1500 CD spectrometer, MSD, conventional cell | |
|---|---|
| Spectral bandwidth | 1 nm |
| Accumulation | 9 times (MSD), 1 time (conventional cell) |
| Data acquisition interval | 0.1 nm |
| Response time | 2 seconds |
| Scan speed | 200 nm/min |
| Sample volume | 10 μ L (MSD), 400 μ L (conventional cell) |
| Path length | 1 mm |

Results

The CD spectra depicted in Figures 1 and 2 compare the results obtained using the MSD and a conventional cell for organic compounds and metal complexes, respectively. Both the organic compounds and metal complexes' data show good correlation between spectra measured with the 10 μ L volume microsampling disk (blue) and 400 μ L volume conventional cell (green), each with a 1 mm path length.

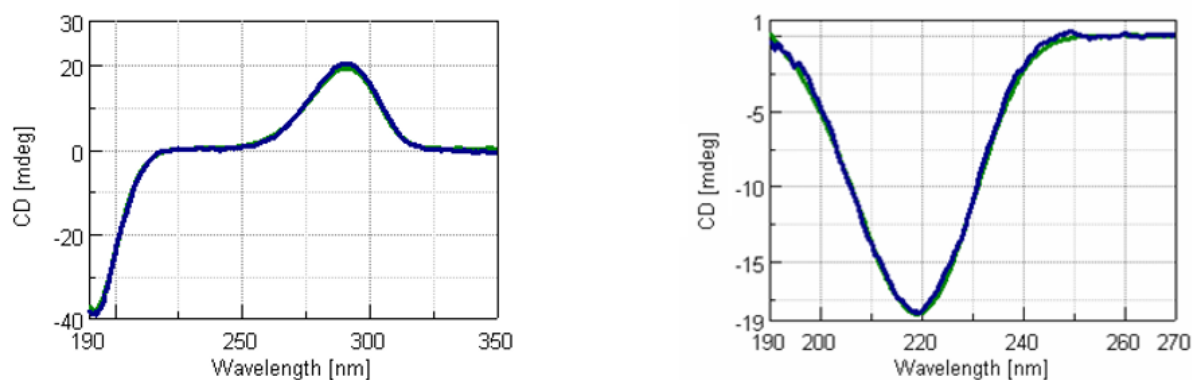


Figure 1. CD spectra of (A) (1S)-(+)-10-Camphorsulfonid acid, ammonium salt and (B) D-Pantolactone using a microsampling disk (blue) and cylindrical cell (green).

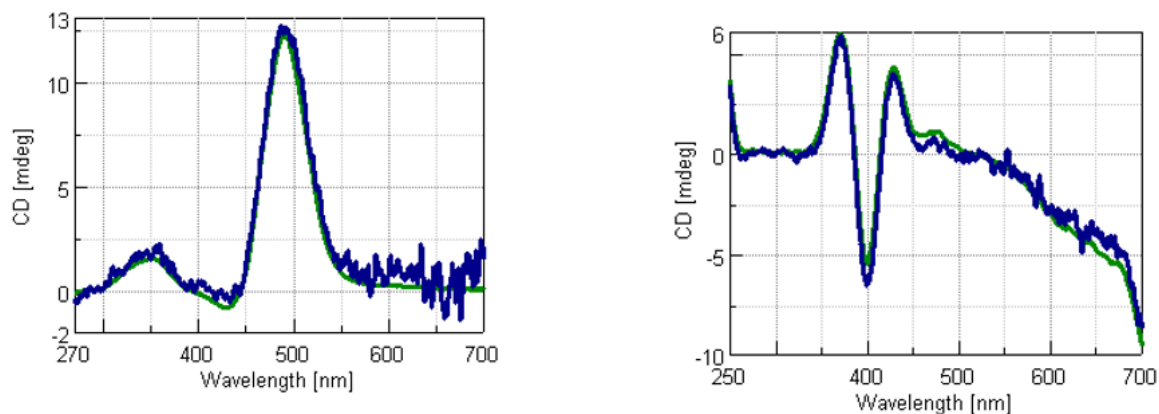


Figure 2. CD spectra of (A) 2(+)-D-[Coen₃]Cl₃NaCl·6H₂O and (B) 0.25 M NiSO₄·6H₂O, 0.36 M Rochelle salt using a microsampling disk (blue) and cylindrical cell (green).

Conclusion

This application note demonstrates that the One-Drop microsampling disk provides reliable spectra for CD spectroscopy measurements in volume-limited samples.