ACQUITY UPLC PDA Detector baseline drift - WKB101116

SYMPTOMS

• It takes half a day to stabilize the baseline from the beginning of instrument use.
• When performing the same measurement with the 2695 Separations Module/2996 PDA Detector, the stabilization time took about 30 minutes to 1 hour.
• The same situation (stepping downward) occurs with multiple analysis conditions and multiple columns (not a specific analysis condition)
• System pressure is stable
• No leaks on the both In and Out sides of the detector

ENVIRONMENT

• ACQUITY UPLC PDA Detector
• ACQUITY UPLC H-Class

CAUSE

1. Check the specifications in the operator's guide for each detector and check the drift tolerance level.
   • ACQUITY UPLC PDA Detector
     Drift a (Dummy cell)
     1000 μAU/hour, time constant of 1 second, 30-sec interval for 230 nm,
     Digital resolution of 3.6 nm 2 Hz, warm-up time of 120 minutes
     Environmental stability: ±2 °C/hour.
     Analytical flow cell condition of 0.4 mL/min, 10/90 Acetonitrile/water
   • 2996 PDA Detector
     Fluctuation
     1 x 10-3AU/hour (254 nm, after warm up )
     ΔT ≤ 1 °C/hour

2. Check the detector energy
   How to read energy on an ACQUITY UPLC PDA detector - WKB68243

3. If the result of step 2 is 230 nm and the energy value is near a value where error occurs (about 1000 counts) in the
initial diagnosis, replace it with a shunt cell and check the energy.
- If the energy value is low with the cell that is normally used, and high with the shunt cell → There is a possibility that the cell is dirty.
   Perform cleaning in step 4, consider cell replacement if cleaning does not help
- If the energy value is low for both the normally used cell and the shunt cell → There may be a problem with the optical of the detector.

4. Clean the cell
   ■ Cleaning method
   ① Remove the column and connect to the detector with a union
   ② Flush all the mobile phase lines with 100% water at a flow rate of 0.2 mL/min for half a day
   ③ Flush all the mobile phase lines with 100% IPA at a flow rate of 0.2mL/min for half a day
   ④ Flush all the mobile phase lines with 100% water at a flow rate of 0.2 mL/min for 1 hour
   ⑤ Flush all the mobile phase lines with 1% formic acid in water at a flow rate of 0.2 mL/min for 3 hours
   ⑥ Flush all the mobile phase lines with 2% ammonia in water at a flow rate of 0.2 mL/min for 3 hours
   ⑦ Flush all the mobile phase lines with 100% water at a flow rate of 0.2 mL/min for 3 hours
   *Use wet prime when replacing the solvent

5. If there is no problem with the energy value, measure with the method normally used with the shunt cell connected.
   *When measuring with a shunt cell, also monitor the room temperature at the same time (check the Room temperature on the Data tab of the ACQ-FTN instrument method)
   If the baseline becomes straight, the cell and/or instrument is dirty.
   If the baseline does not become straight, the cause is the optical of the instrument or the environmental factors

6. In addition, check the following
   - With ACQUITY UPLC H-Class QSM, prime all four mobile phase lines with mobile phase and perform measurement (contact with other mobile phases may be the cause)
   - Add the mobile phase to the purchased organic solvent bottle (as soon as possible after opening it) and perform measurement (the surfactant remaining in the glass bottle which washed with detergent may be the cause)
   - Confirm that the air-conditioning wind is not hitting the detector, if it is hitting, perform measurement with the air conditioner stopped
   - If the room is kept cool at all times, make sure that the mobile phase has reached about the room temperature before measuring (the warm mobile phase that has just been prepared colding down may be the cause).

7. If temperature is suspected, change the Console > PDA > Preferences > Optic temperature equilibrium to "Maximum"

ADDITIONAL INFORMATION

Part number for the PDA or UV ACQUITY shunt cell - WKB10116 (shunt cell part number)

https://support.waters.com/KB_Inst/Chromatography/WKB10116_ACQUITY_UPLC_PDA_Detector_baseline_drift
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