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Supelco SLB®-IL60 Ionic Liquid GC Columns

Unique Selectivity

The SLB-IL60 column is able to undergo the same analyte-phase interactions as polyethylene glycol (PEG) columns, but at different relative amounts. Based on its unique phase structure, the SLB-IL60 column is also able to undergo additional interactions that PEG columns cannot.

- With PEG columns, possible interactions appear to be dispersive, hydrogen bonding, and acid-base interactions
- With the SLB-IL60 column, possible interactions appear to be dispersive, dipole-dipole, dipole-induced dipole, π-π, hydrogen bonding, and acid-base interactions

As such, the SLB-IL60 column may retain some polar and polarizable analytes relatively longer, and some non-polar analytes relatively less. This results in unique and alternate selectivity compared to PEG columns.

The SLB-IL60 column was compared directly to five popular commercially available PEG columns, each from a different manufacturer. All columns were 30 m x 0.25 mm I.D., 0.25 µm dimensions, except the SLB-IL60 column, which has a 0.20 µm film thickness. **Table 1** shows the maximum temperature limits for all columns tested. Complete specifications of SLB-IL60 columns are shown in **Table 2**.

Table 1. Maximum Temperature Limits *

Column	Isothermal	Programmed
PEG 1	280 °C	280 °C
PEG 2	260 °C	270 °C
PEG 3	250 °C	260 °C
PEG 4	250 °C	260 °C
PEG 5	280 °C	300 °C
SLB-IL60	300 °C	300 °C

* Obtained from paperwork included with commercial columns.

Fatty Acid Methyl Esters (FAMEs)

A 38-component FAME mix was analyzed on each column under identical conditions. All five PEG columns produced very similar chromatography, with the PEG 3 column producing the best overall resolution. **Figure 1** *(see back page)* shows chromatograms obtained from the PEG 3 and SLB-IL60 columns. Observations are that the SLB-IL60 column provides:

- An overall faster elution (36 minutes compared to 52 minutes)
- Resolution of C18:1n9c (peak 17) and C18:1n9t (peak 18)
- Elution of trans isomers (peaks 18 and 20) before cis isomers (peaks 17 and 19)
- Less relative retention of C20:3n3 (peak 28) resulting in an elution order change
- Elution of C22:6n3 (peak 37) before C22:5n3 (peak 35)

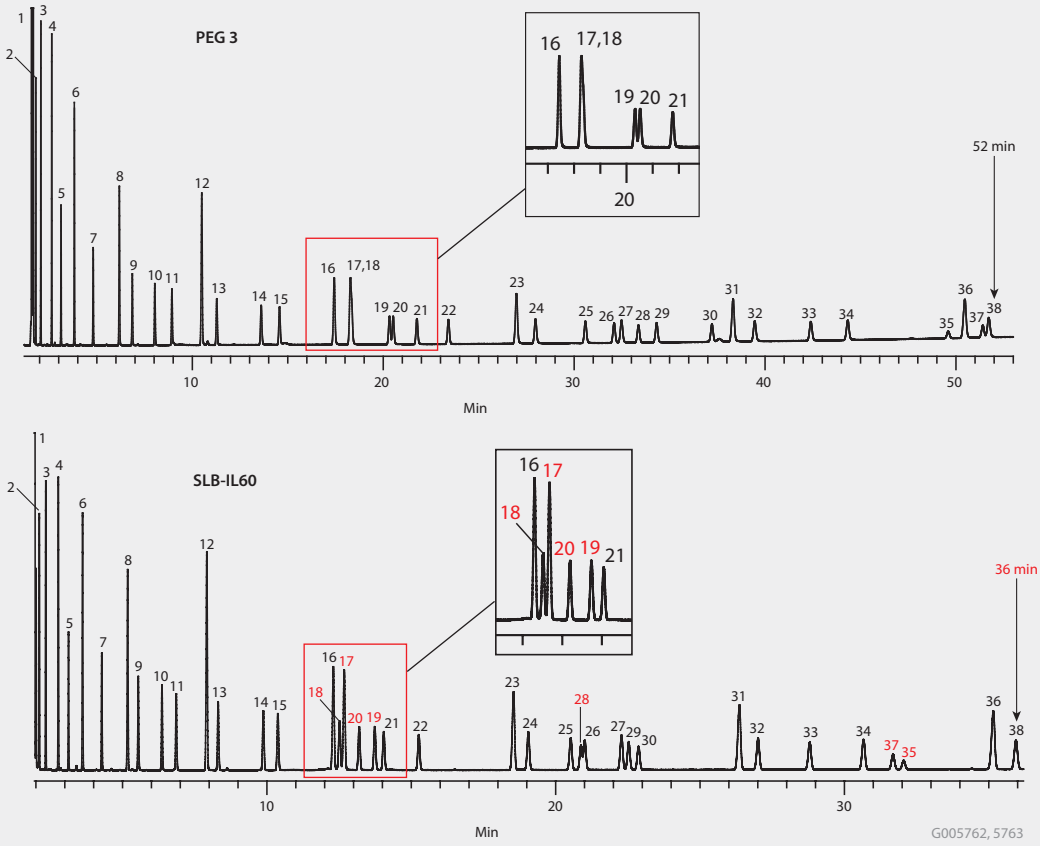
Table 2. SLB-IL60 Column Specifications

- Application: The SLB-IL60 polar ionic liquid column has a polarity/selectivity similar to that of polyethylene glycol (PEG) columns (usually have 'wax' in the product name), but different enough to provide a unique elution pattern. It also has a higher maximum temperature of 300 °C, compared to 250-280 °C for most PEG columns. These features make it an excellent alternative to existing 'wax' columns. The combination of a high thermal limit and an orthogonal selectivity to non-polar columns also makes it a good GCxGC column choice. Launched in 2012.
- USP Code: None
- Phase: Non-bonded; proprietary
- Temp. Limits: 35 °C to 300 °C (isothermal or programmed)

Figure 1. FAMEs

column 1: PEG 3, 30 m x 0.25 mm I.D., 0.25 µm
column 2: SLB-IL60, 30 m x 0.25 mm I.D., 0.20 µm (29505-U)
oven: 170 °C, 1 °C/min to 225 °C
inj. temp.: 250 °C
carrier gas: helium, 1.2 mL/min
det.: FID, 260 °C
injection: 1 µL, 100:1 split
liner: 4 mm I.D., split/splitless type, single taper wool packed FocusLiner™ design
sample: Supelco 37-Component FAME Mix (47885-U) + C22:5n3, in methylene chloride

1. C4:0
2. C6:0
3. C8:0
4. C10:0
5. C11:0
6. C12:0
7. C13:0
8. C14:0
9. C14:1
10. C15:0
11. C15:1
12. C16:0
13. C16:1
14. C17:0
15. C17:1
16. C18:0
17. C18:1n9c
18. C18:1n9t
19. C18:2n6c
20. C18:2n6t
21. C18:3n6
22. C18:3n3
23. C20:0
24. C20:1n9
25. C20:2
26. C20:3n6
27. C21:0
28. C20:3n3
29. C20:4n6
30. C20:5n3
31. C22:0
32. C22:1n9
33. C22:2
34. C23:0
35. C22:5n3
36. C24:0
37. C22:6n3
38. C24:1n9



Featured Products

Description	Cat. No.
SLB-IL60, 15 m x 0.10 mm I.D., 0.08 µm	29503-U*
SLB-IL60, 30 m x 0.25 mm I.D., 0.20 µm	29505-U
SLB-IL60, 60 m x 0.25 mm I.D., 0.20 µm	29506-U*
SLB-IL60, 30 m x 0.32 mm I.D., 0.26 µm	29508-U*
SLB-IL60, 60 m x 0.32 mm I.D., 0.26 µm	29509-U*

*Products will be available soon.
Visit **sigma-aldrich.com/il-gc** for updates.

For more information on the SLB-IL60 and other ionic liquid columns, visit
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