thermo scientific

Thermo Scientific TraceGOLD GC capillary columns

High-resolution Thermo Scientific TraceGOLD polycyclic aromatic hydrocarbon (PAH) gas chromatography column for complex food and environmental samples

Polycyclic aromatic hydrocarbons (PAHs) are one of the most widespread organic pollutants. The Thermo Scientific™ TraceGOLD™ TG-PAH column is specifically designed for the rapid analysis of PAHs in complex food and environmental samples. High selectivity and high chromatographic resolution of the capillary silica-based columns combined with the unique bonded chemistry ensure accurate separation of isobaric compounds even at very low concentration levels. Lab productivity and costs per sample are boosted by the exceptional thermal stability and robustness of the new column. Sensitivity is of paramount importance in meeting regulatory standards in the challenging trace analysis. Trust TraceGOLD columns to achieve your regulatory goals.

Product highlights

- **Fast analysis of regulated PAHs** – increase productivity in high sample throughput labs.
- **Maximize resolution for critical isobaric PAHs** – avoids false-positive and erroneous compound quantification and minimizes re-runs.
- **Robustness and reliability at high temp up to 360°C** – deliver consistent and reliable results of PAHs including challenging heavy dibenzopyrene.
- **Low column bleed** – results in lowering detection limits in food and environmental samples.

Column technology

Thermo Scientific TG-PAH columns are designed specifically to analyze regulated PAHs in food and environmental samples. High selectivity and maximum resolution of TG-PAH columns ensure accurate results for critical isobaric PAH compounds and high sample throughput in your lab.

Separation of polycyclic aromatic hydrocarbons

The persisting and carcinogenic nature of some PAH compounds pose a potential hazard to human and environmental health. Therefore, many countries implement regulatory measures on the determination of the toxic PAH in food and environmental samples. The challenges of determining specific PAHs by GC-MS are that several isobaric PAHs have the same mass and closed retention times. The table below shows some difficult isobaric compounds listed in EU, and U.S. EPA regulated PAHs.

Compound	Mass
Phenanthrene	178
Anthracene	178
Benzo[a]anthracene	228
Triphenylene	228
Chrysene	228
Benzo[b]fluoranthene	252
Benzo[k]fluoranthene	252
Benzo[j]fluoranthene	252
Indeno[1,2,3-cd]pyrene	276/278
Dibenzo[a,h]anthracene	278/276
Benzo[g,h,i]perylene	276/278
Dibenzo[a,l]pyrene	302
Dibenzo[a,e]pyrene	302
Dibenzo[a,i]pyrene	302
Dibenzo[a,h]pyrene	302

Learn more at **thermofisher.com/gc-columns**

ThermoFisher SCIENTIFIC

Fast analysis for high productivity

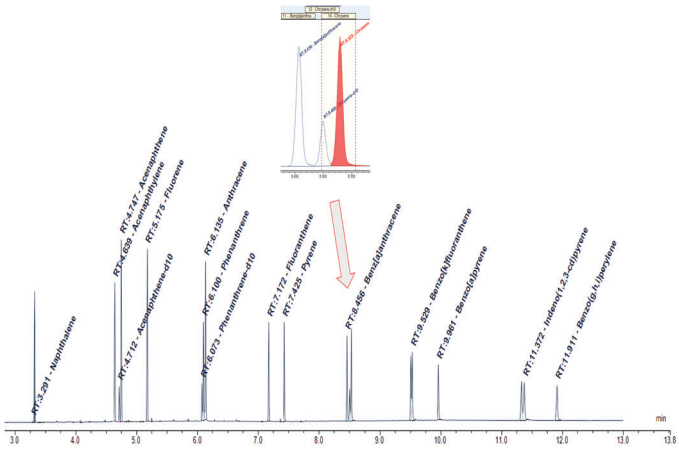

Figure 1. Fast analysis of the regulated 16 native PAHs (add three additional isotopically labelled PAH isomers used as internal standards) can be achieved on a TG-PAH, 40m column (p/n: 26055-3570). The zoomed-in region of the chromatogram shows excellent separation of benzo[a]anthracene, chrysene-D12 and chrysene.

Robustness and reliability at high temp

High column temperatures of 350°C are required for the elution of the low volatility debenzopyrenes. Operating at such high temperature is challenging and can affect column robustness and overall performance. However, as shown in Fig 3, the TG-PAH columns maintain a high thermal stability even after hundreds of cycles of injections.

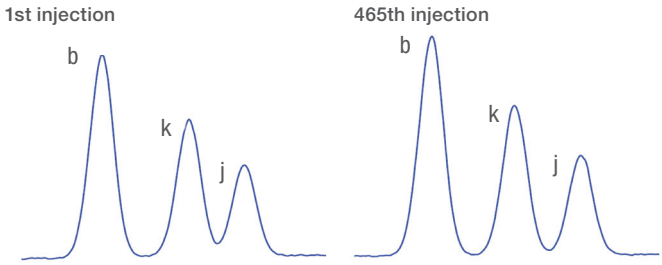

Figure 3. A complete separation of critical Benzo[j+b+k]fluoranthene in EU priority PAHs was maintained after over n=460 injections despite the final temperature being 350°C.

Maximize resolution for critical isobaric PAHs

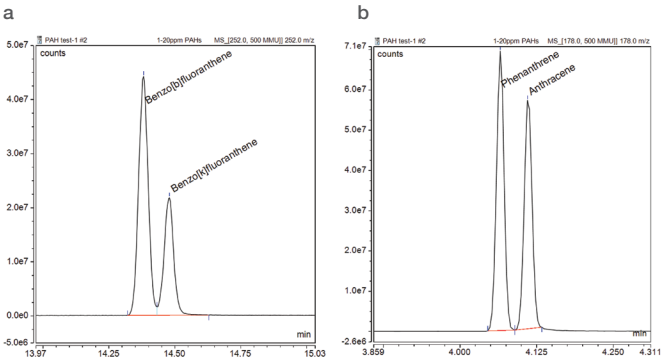

Figure 2. The chromatograms show the separation of critical pairs on a 30m × 0.25mm × 0.1µm TG-PAH column (p/n: 26055-0470), This 0.25 mm ID column provides good sample capacity, which is suitable for the labs working on the samples with a wide range of concentration and complex matrix. (a) the benzo[b]fluoranthene (*m/z*: 252) well separated from benzo[k]fluoranthene (*m/z*: 252) (b) a complete separation of phenanthrene (*m/z*: 178) and anthracene(*m/z*: 178).

Low column bleed for PAHs trace analysis

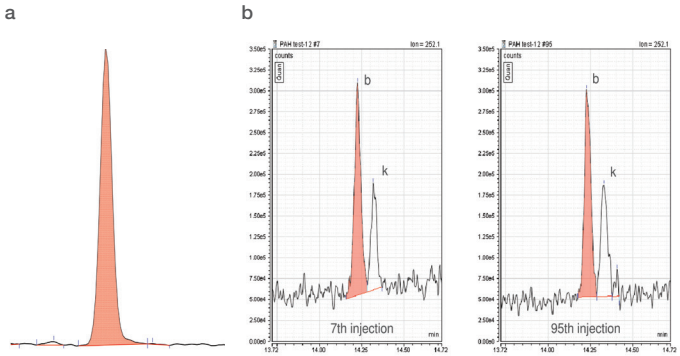

Figure 4. Due to low column bleed, the detection of fg level of PAHs is achievable on using the Thermo Scientific™ ISQ™ 7000 single quadruple GC-MS using TG-PAH column (p/n: 26055-0470). (a) 200 fg on-column pyrene acquired in Selected Ion Monitoring (SIM) mode; (b) 2ppb of benzo[b] fluoranthene and 1ppb of benzo[k]fluoranthene in QuEChERS extracted strawberry under a split injection ratio of 5:1 and MS full-scan mode. The resolution and peak intensities of low-level PAH maintained in over n=90 injections.

TG-PAH column specifications

Cat. No	Length (m)	ID (mm)	Film Thickness (µm)	Temp Limits (°C)	Main benefits
26055-0470	30	0.25	0.1	350/360	Fast analysis and high sample capacity
26055-3570	40	0.18	0.07	350/360	Fast and complete separation
26055-0120	60	0.25	0.1	350/360	Complete separation and high sample capacity

For more information, and to buy online visit
thermofisher.com/gc-columns

FL21865-EN 0419S

ThermoFisher SCIENTIFIC