Optimization of the thermal modulation in comprehensive two-dimensional gas-chromatography

**Conclusions**

- Using a thermal modulator, an accurate optimization of the thermal conditions is necessary to obtain a proper modulation ratio, especially for wide range of b.p., samples.
- The cold jet flow and the hot jet pulse time can be used to rise the theoretical modulation ratio.
- A proper operation of the modulator improve quantitative remobilization of material into the secondary column.
- Controlling the cold jet flow during and after run allows a reduction of gas and liquid nitrogen consumption.

**References**


**Aknowledgements**

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Optimization of the modulation on a wide boiling point range sample (36°C-431°C)

Figure 1: Unmodulated nC5-nC28 analysis

Figure 2: Minimum cold flow nC5 peak modulation

Figure 3: Modulated nC5-nC28 analysis

Figure 4: Optimized modulated nC5-nC28 analysis

Figure 5: 2-D view

**Figure 1**: nC5-nC28 unmodulated analysis for peak abundance measurement

**Figure 2**: Determination of the minimum cold flow necessary to Modulate the nC5 (b.p.36°C) peak

**Figure 3**: nC5-nC28 modulate analysis at constant cold flow (at the minimum value to modulate the nC5)

**Figure 4 & 5**: nC5-nC28 modulate analysis with optimized cold flow rate and hot pulse time, in order to obtain the proper theoretical modulation ratio

**Figure 3**: nC5-nC28 analysis

**Figure 4**: Optimized modulated nC5-nC28 analysis

**Figure 5**: 2-D view