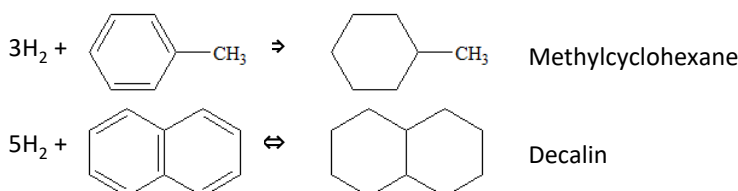


Hydrogen is expected to become an important source of clean energy that does not result in CO<sub>2</sub> emissions, and this is creating an urgent need to develop technologies to easily handle hydrogen in production, transport, storage, and use.

Hydrogen is a gas at normal temperatures and pressures. To liquefy, it must be cooled to less than -250 °C under high pressure, which is a major obstacle to mass transport and mass storage. At present, the development of materials as hydrogen carriers is being promoted; these can be used to efficiently transport and store hydrogen at low cost. Materials that can be used as hydrogen carriers include organic hydrides, ammonia, alcohols, and metals. Organic hydrides are compounds to which hydrogen is added to form aromatic compounds; these can be stored and extracted using catalysts - two examples are methylcyclohexane and decalin.

Examples)  $3\text{H}_2 + \text{N}_2 \rightleftharpoons 2\text{NH}_3$



Structures created using Chemistry 4-D Draw provided  
By ChemInnovayion Software, Inc.

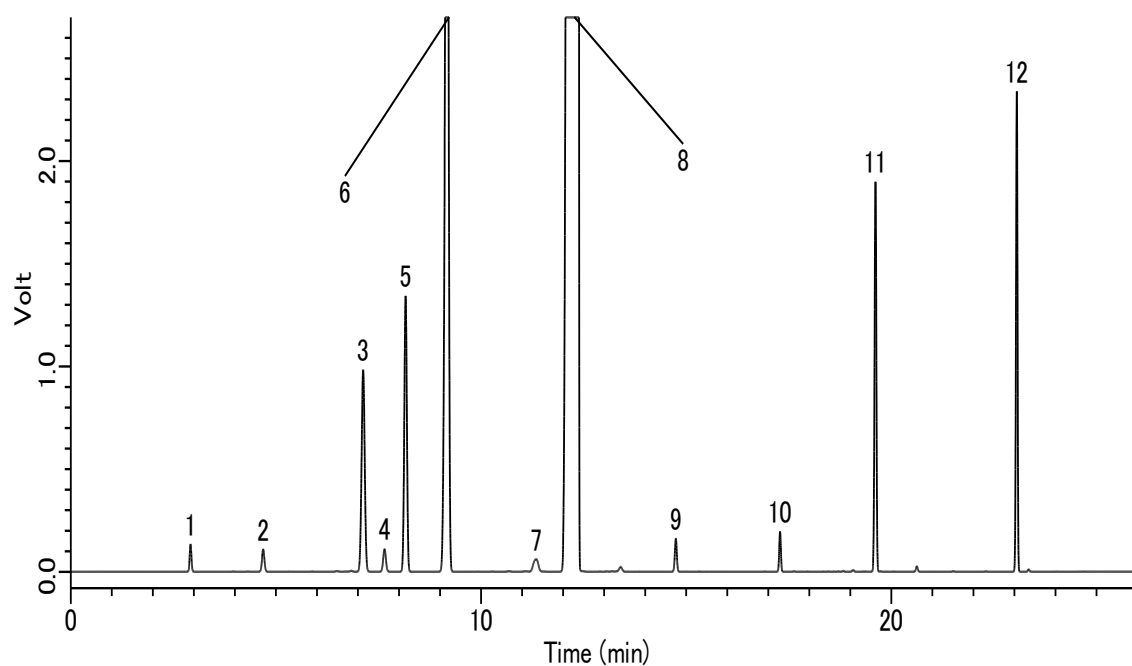
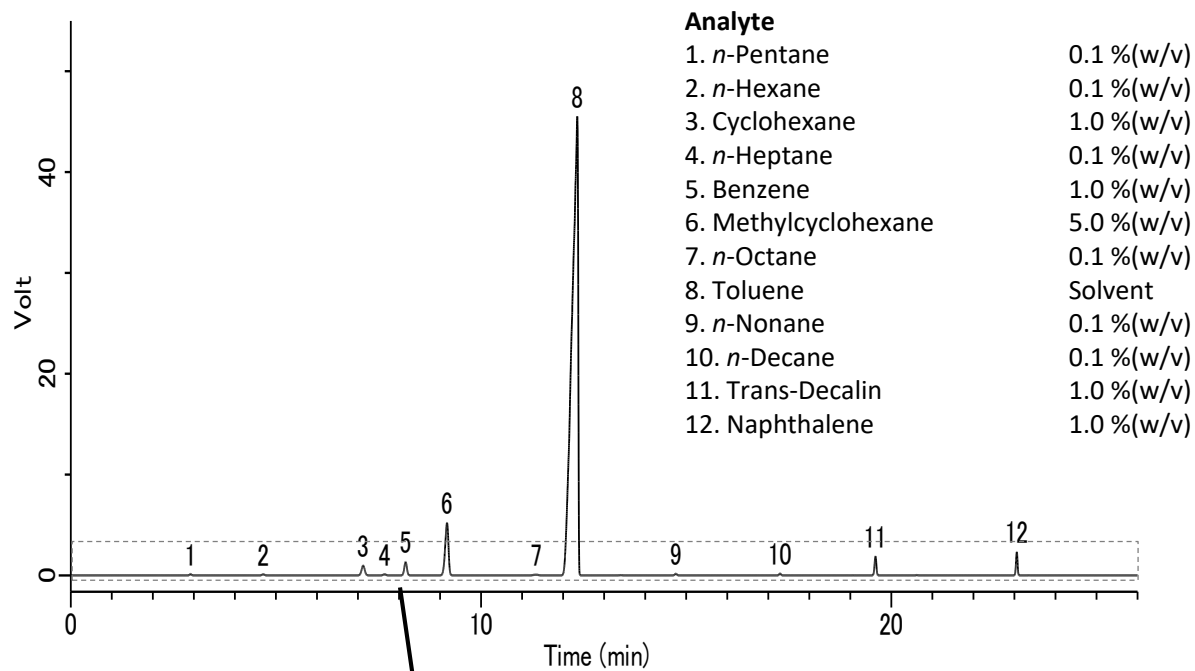
In this application, two columns were used with non-polar liquid and neutral polar liquid phases, InertCap 1 and InertCap AQUATIC-2, respectively, representative components of organic hydrides were measured with good separation.

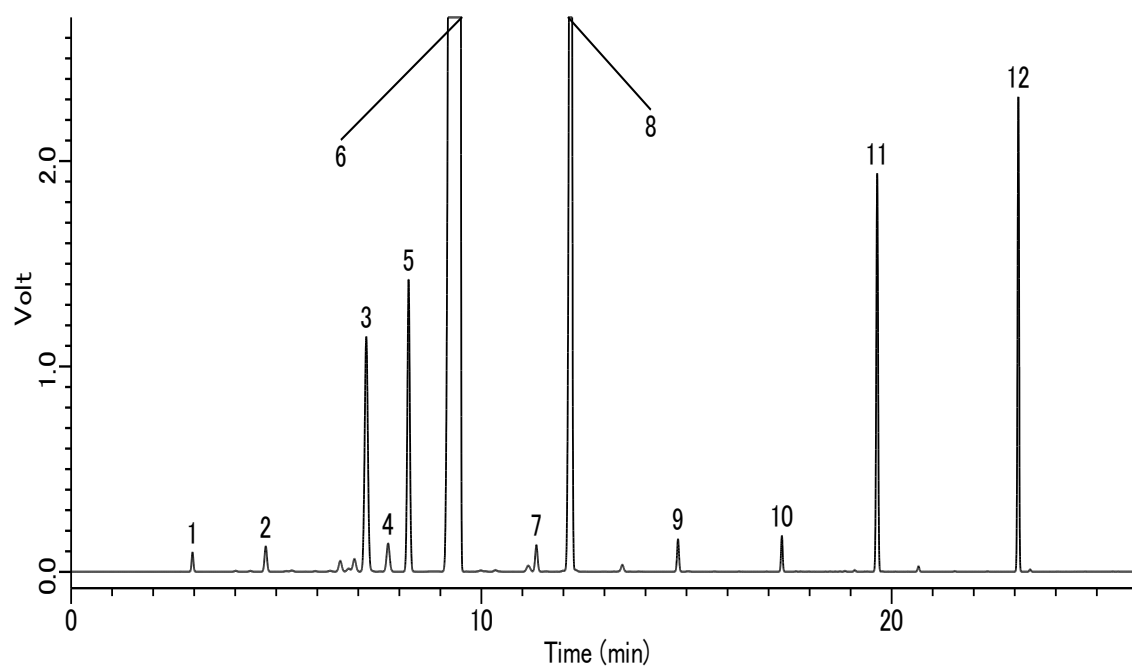
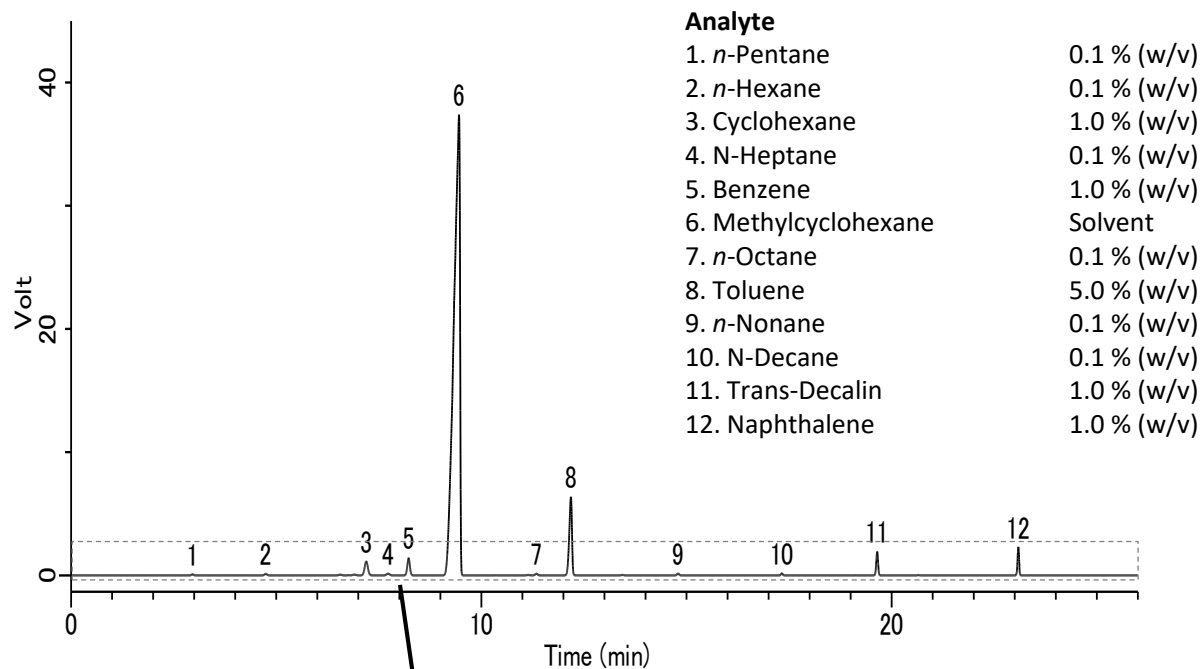
### **Conditions 1**

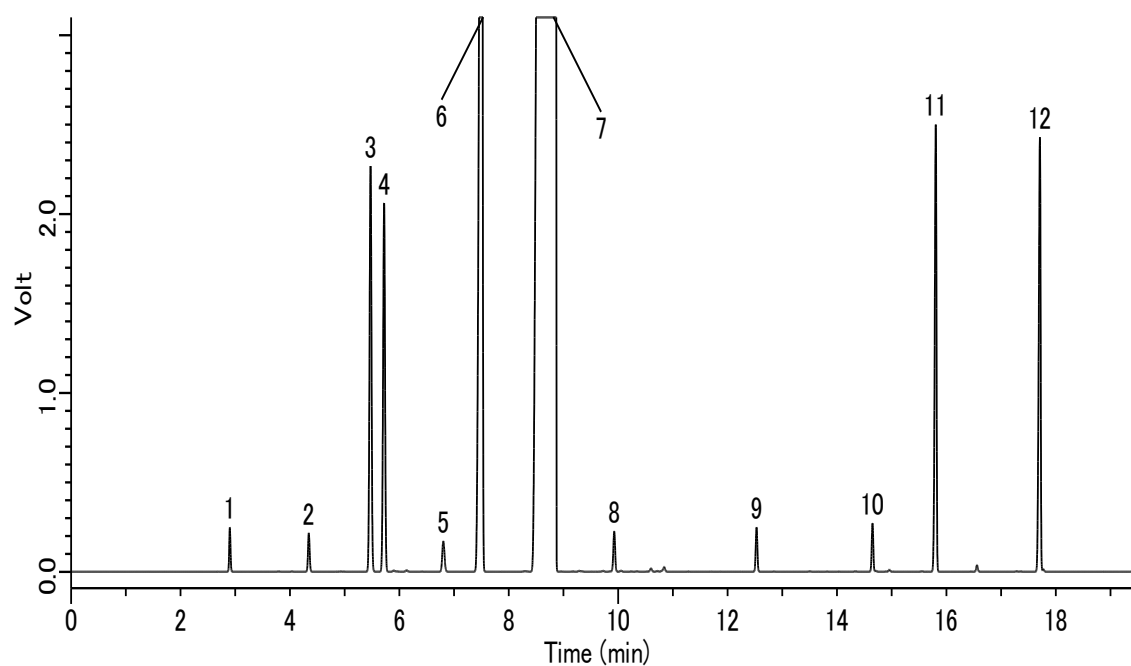
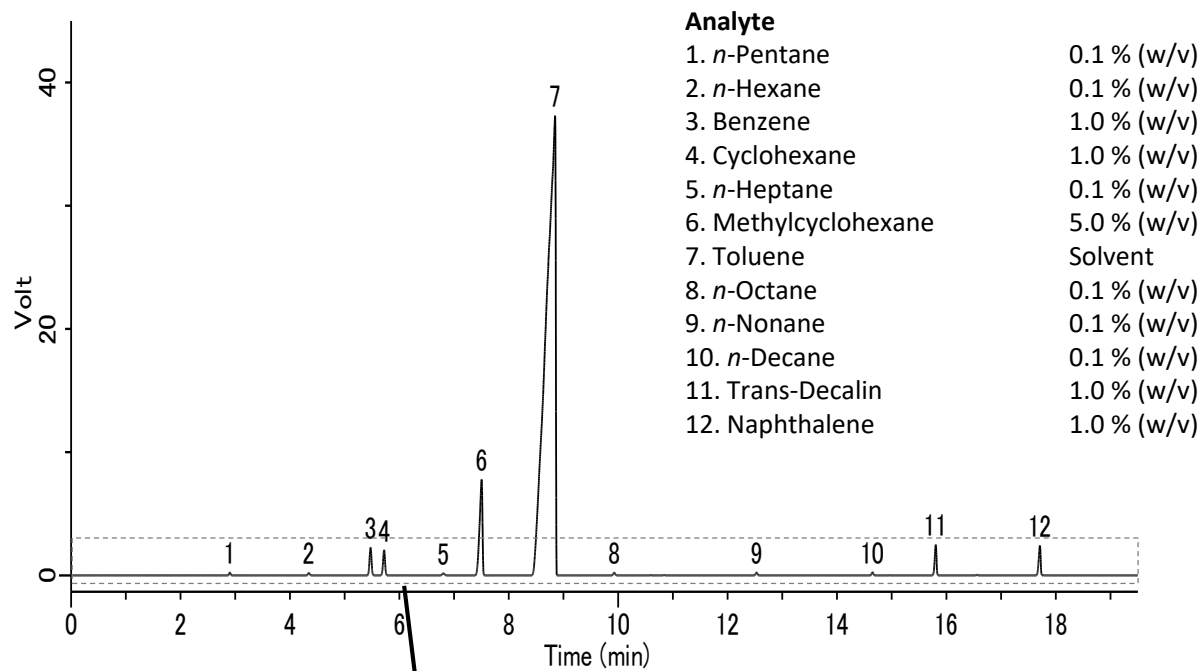
<b>System</b>	: GC - FID
<b>Column</b>	: InertCap AQUATIC-2 0.32 mm I.D. x 30 m df = 1.8 μm
<b>Col. Temp.</b>	: 40 °C (3 min hold) - 5 °C/min - 90 °C - 10 °C/min - 220 °C
<b>Carrier Gas</b>	: He 1.7 mL/min
<b>Injection</b>	: Split flow 34 mL/min 230 °C
<b>Detection</b>	: FID Auto Range 250 °C
<b>Sample Size</b>	: 0.5 μL

### **Conditions 2**

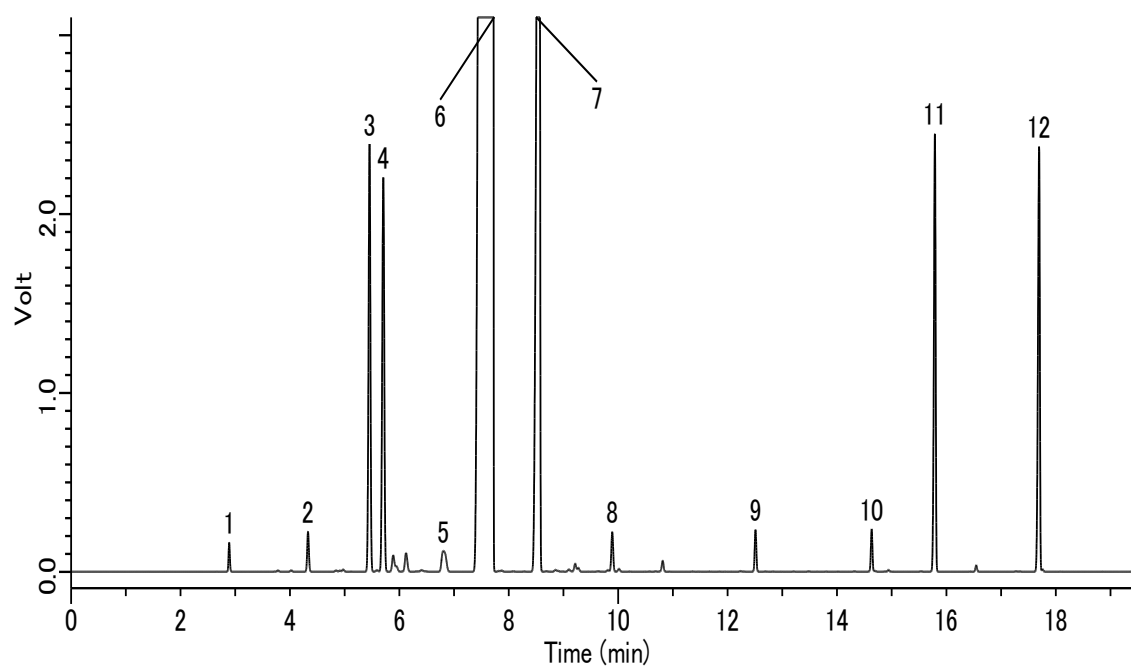
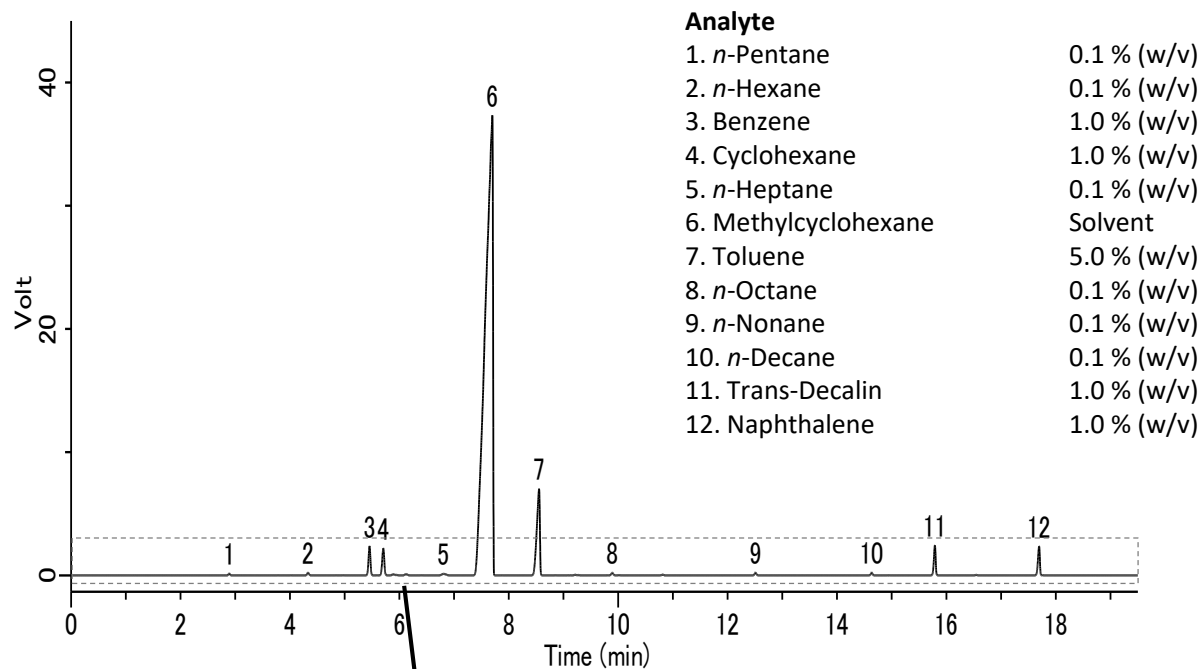
<b>System</b>	: GC - FID
<b>Column</b>	: InertCap 1 0.32 mm I.D. x 30 m df = 1.0 μm
<b>Col. Temp.</b>	: 40 °C (2 min hold) - 5 °C/min - 75 °C - 10 °C/min - 180 °C
<b>Carrier Gas</b>	: He 1.7 mL/min
<b>Injection</b>	: Split flow 34 mL/min 230 °C
<b>Detection</b>	: FID Auto Range 250 °C
<b>Sample Size</b>	: 0.5 μL

**Examples: Analysis of Standard Samples (InertCap AQUATIC 2)**

**Examples: Analysis Standard Samples (InertCap AQUATIC-2)**

**Examples: Analyses of reference samples (InertCap 1)**

## Examples of analyses of reference samples (InertCap 1)



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