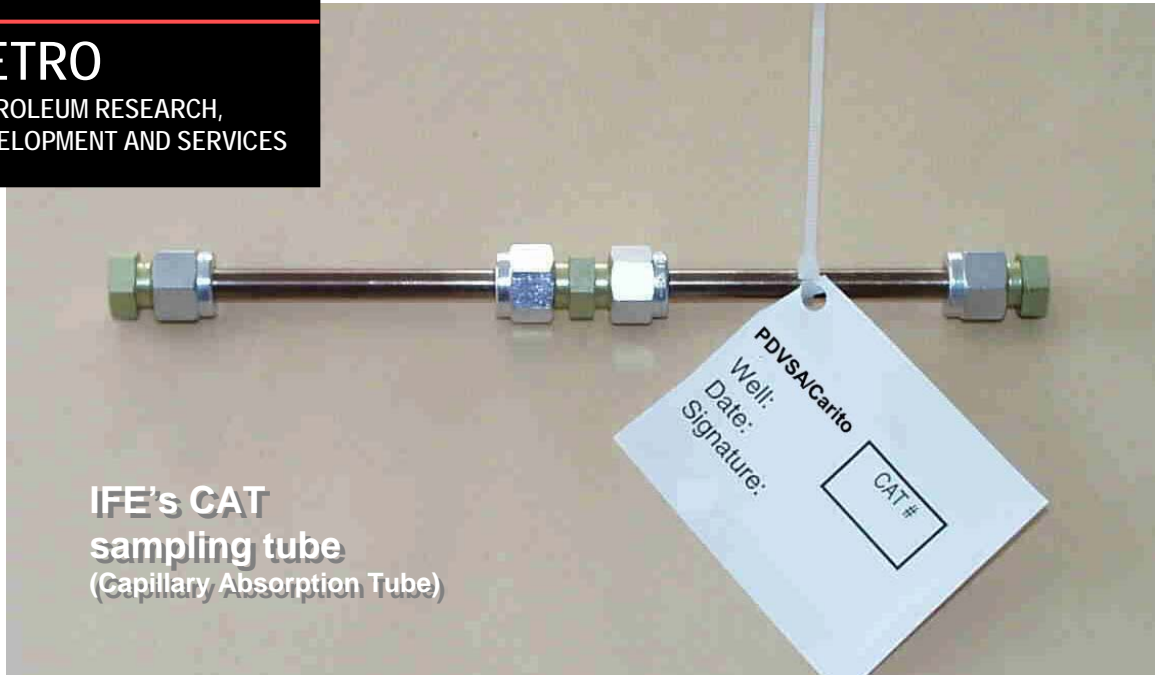


# PETRO

PETROLEUM RESEARCH,  
DEVELOPMENT AND SERVICES



IFE's CAT  
sampling tube  
(Capillary Absorption Tube)

## Non-Radioactive GAS TRACER ANALYSIS

• Gas tracer analysis with confident tracer identification at lowest concentration levels without sampling on pressurised cylinders

### METHOD IN SHORT

IFEs advanced sampling technique is based on a so-called capillary absorption tube, CAT. Two CATs are mounted in tandem where the second CAT is only a built-in quality control that all tracer has been absorbed on the first CAT. Analysis by GC/MS combined with Thermal Desorption provides:

- a factor 50 lower detection limits
- confident tracer identification (mass spectrometry)
- gas sampling without pressurised cylinders

### BENEFITS

Your benefits are:

- less tracer needed
- unrestricted sample shipment
- no cylinder rental
  - cost efficient tracer projects
  - faster tracer results
  - environmental savings



*Field sampling kit where the tandem capillary absorption tube is mounted for controlled absorption of PFC tracers onto the tube filling material. The kit is enclosed in a solid metal transportation carry-along case.*



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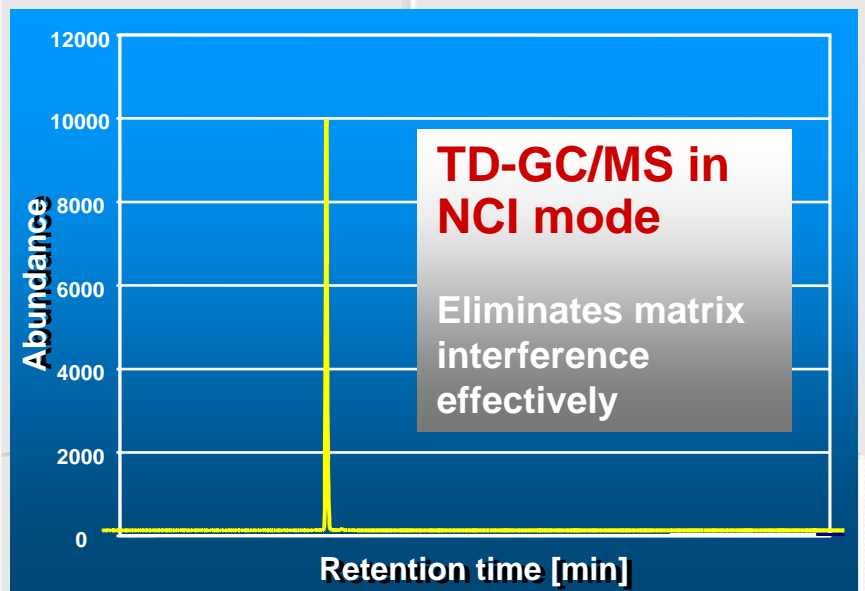
## DEPARTMENTS AT IFE

### HALDEN

COMPUTERISED OPERATION SUPPORT SYSTEMS  
DATA PRODUCTION AND EVALUATION  
EXPERIMENT ENGINEERING  
INDUSTRIAL PSYCHOLOGY  
OPERATION CENTRES  
RADIATION PROTECTION  
REACTOR OPERATION AND ENGINEERING  
TEST RIG DESIGN AND PRODUCTION  
VISUAL INTERFACE TECHNOLOGIES  
NUCLEAR MATERIALS TECHNOLOGY  
ICT RISK AND DEPENDABILITY

### KJELLER

ENERGY SYSTEMS  
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ISOTOPE LABORATORIES  
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EL. BEAM WELDING/MECHANICAL WORKSHOP  
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REACTOR OPERATION  
**RESERVOIR AND EXPLORATION TECHNOLOGY**



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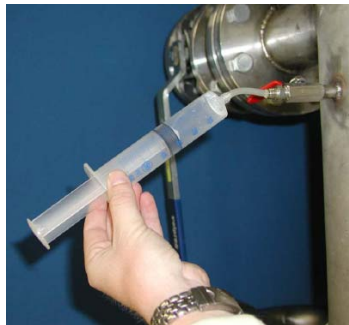


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## GENERAL PROCEDURE

A defined volume of a reservoir gas sample is adsorbed on a capillary absorption tube, **CAT**. The **CAT** can be shipped in an ordinary letter by post or any **Express Service** to our laboratory. At our laboratory, the **CAT** is placed into an **automated Thermal Desorber**, where the gas sample is desorbed and introduced into the **GC/MS**. Due to a special instrument configuration the reservoir gas matrix is wiped out and undisturbed “**finger prints**” of each tracer are produced. Thus confident tracer identification and quantification at [**pL/L**] gas concentrations are made possible.



- Find a suitable connection for gas sampling
- If necessary, mount a needle valve and/or a back pressure regulator
- Bleed carefully the gas into a 50 ml syringe through a silicone tubing
- Close, by pinching, the silicone tubing

*If visible amounts of oil is bleeding through the silicone tubing, a simple miniseparator may be constructed made of plastic or glass (depending on the fluid temperature) as shown in the figure above.*