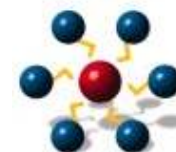


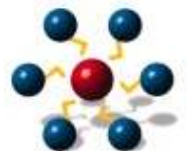
Provhantering i IR

Matti Hotokka



Tekniker

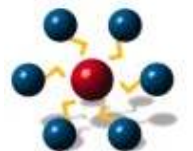
- ⇒ KBr tablett
- ⇒ Vätskecell
- ⇒ Gascell
- ⇒ Mikroskop
- ⇒ ATR
- ⇒ DR
- ⇒ Övriga tekniker



KBr tablett

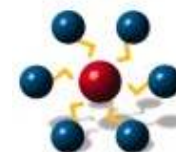
Tekniken

- ⇒ Den viktigaste tekniken för fasta prov
- ⇒ Både vanlig och mikrotablett
- ⇒ Provmängd 1-3 mg (några mikrogram)
- ⇒ Viktigt att proven malas / blandas omsorgsfullt



KBr tablet

Mortel



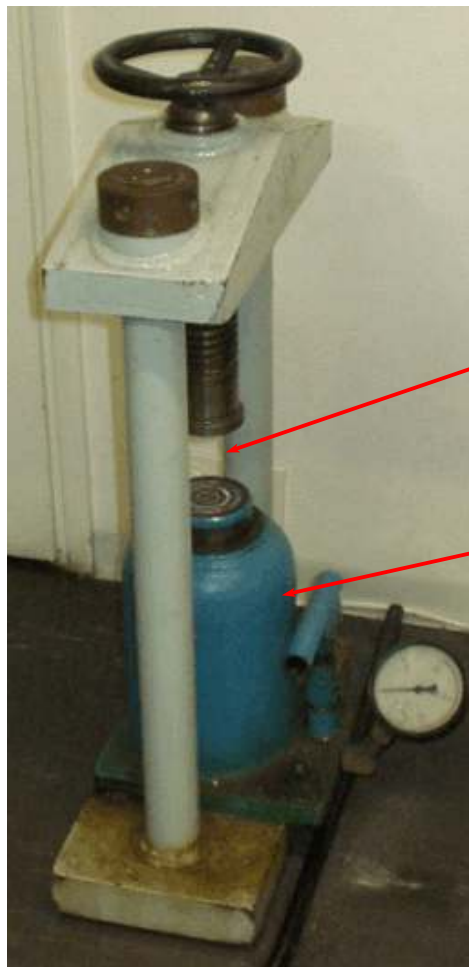
KBr tablet

Tabletpress



KBr tablett

Tryckpress



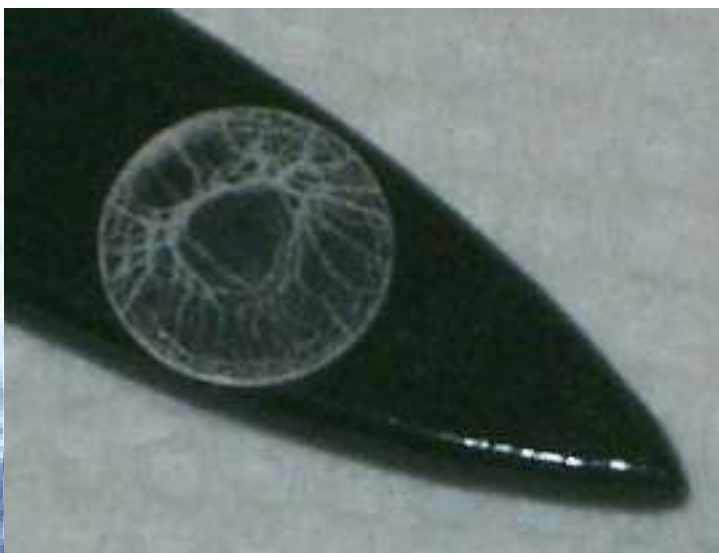
Tabletpress

Tryckpump



KBr tablet

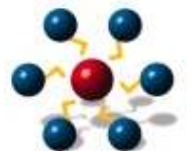
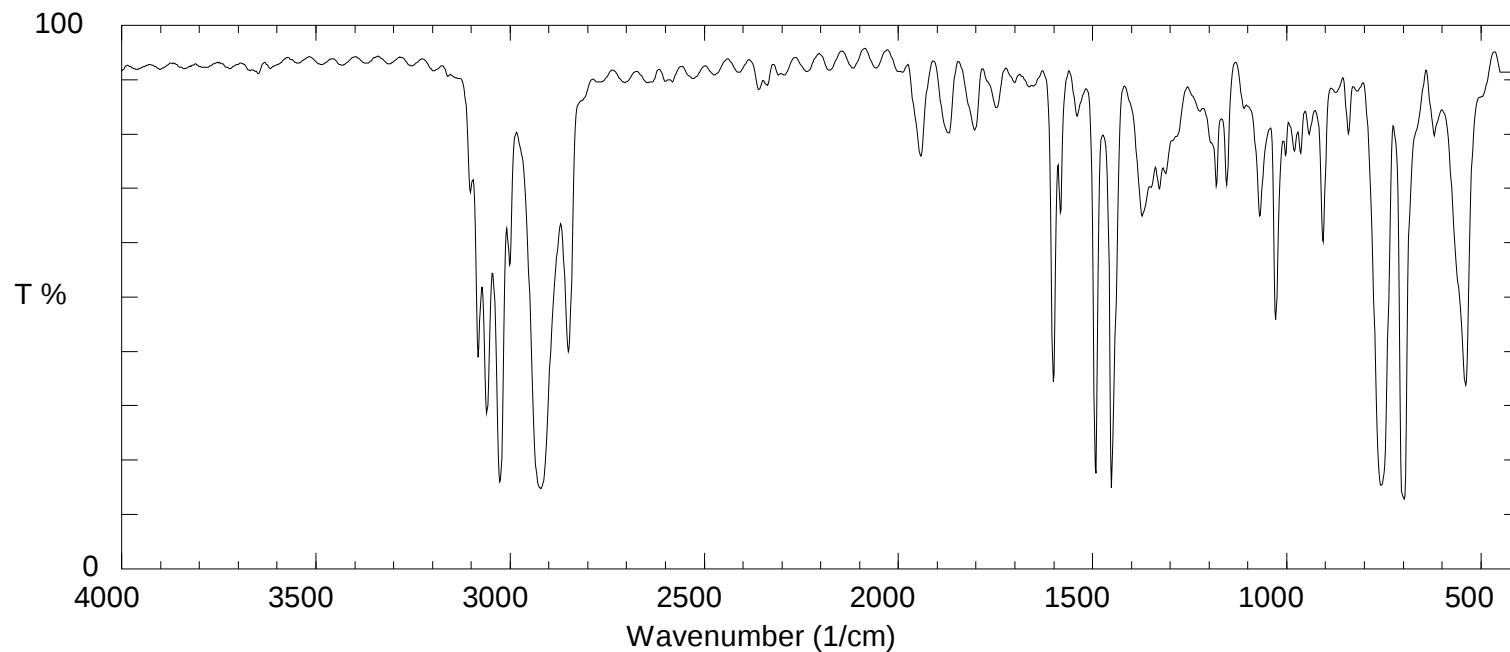
Tablet



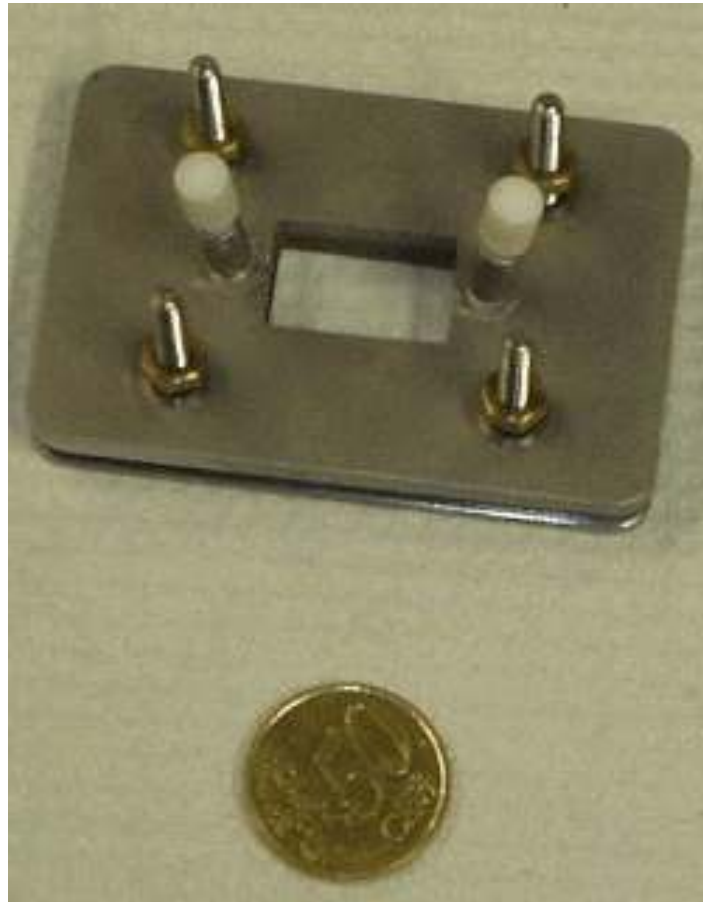
Vätskecell

Teknik

- ⇒ Vätskelagers tjocklek kan justeras
- ⇒ Kan ge interferens (Newtons ringar)

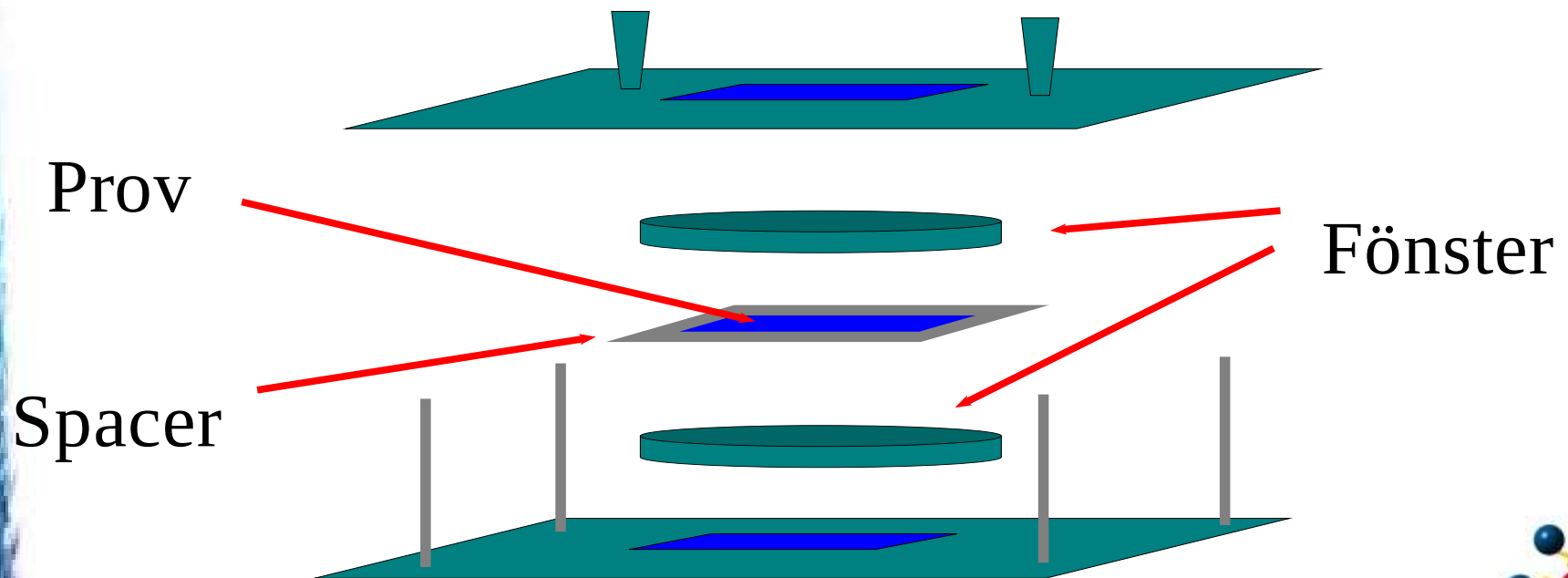


Vätskecell



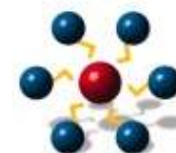
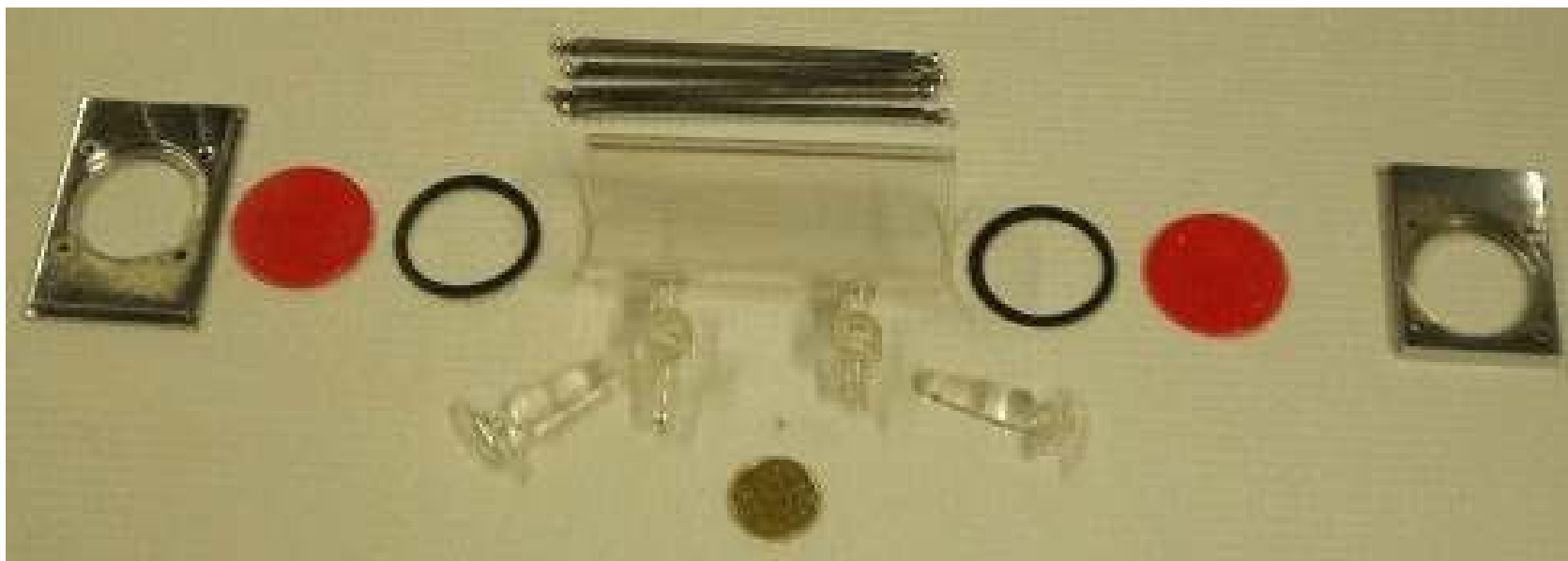
Vätskecell

Schematiskt

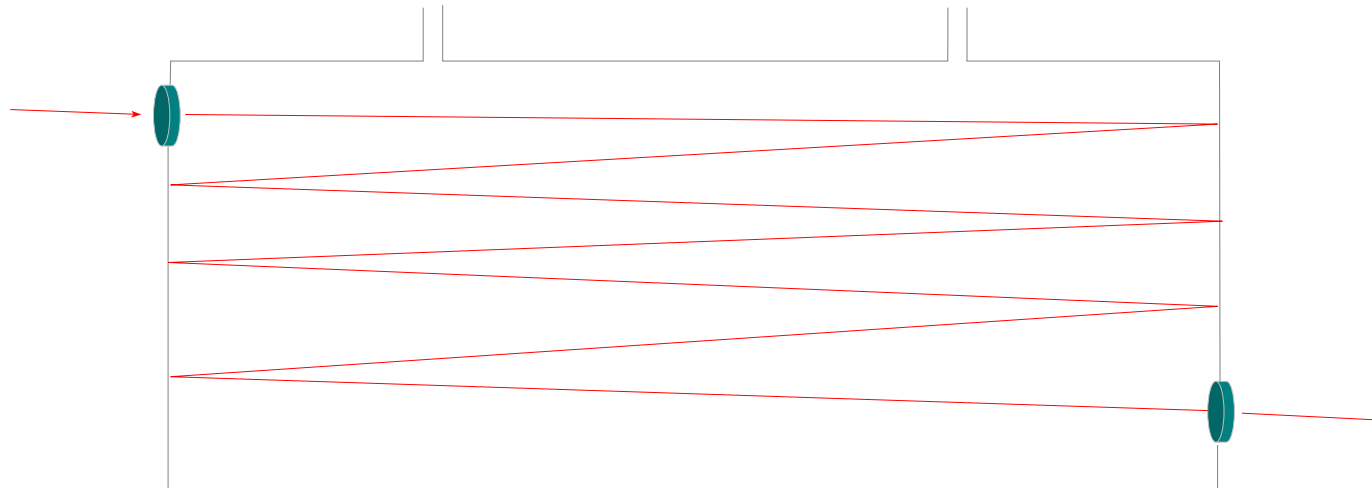


Gascell

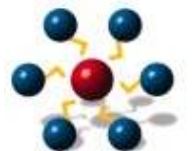
10 cm cell för enkla prov



Gascell

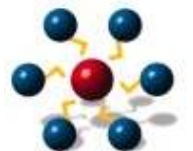


Dimension: 10 cm; optisk längd: 20 m.



Mikroskopering

- ⇒ En av de viktigaste teknikerna inom industrin
- ⇒ En rad olika attiraljer
- ⇒ Mapping



Mikroskopering



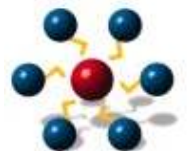
[Http://www.bruker.com/](http://www.bruker.com/)



Mikroskopering

Utrustning

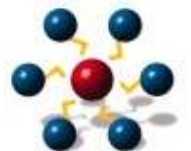
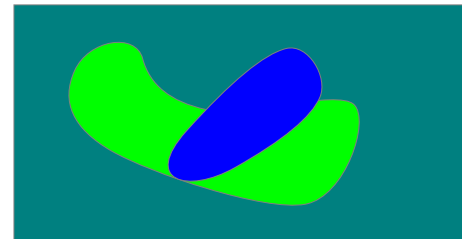
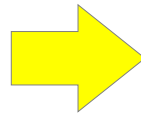
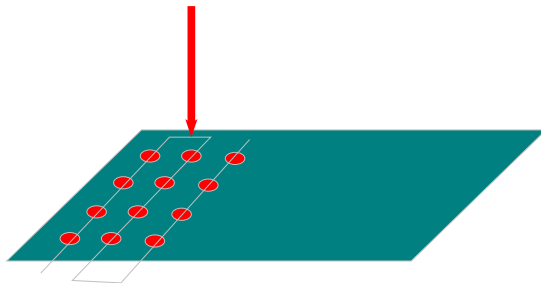
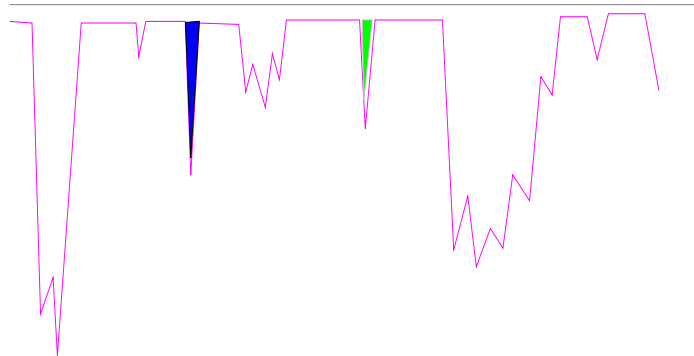
- ⇒ Mikrotablett
- ⇒ Fiberställning
- ⇒ ATR objektiv
- ⇒ Diamantprovhållare för prov under tryck
- ⇒ Mm.



Mikroskopering

Mapping

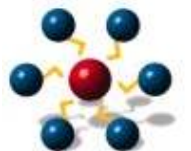
Amine I peak



ATR

Attenuated Total Reflection

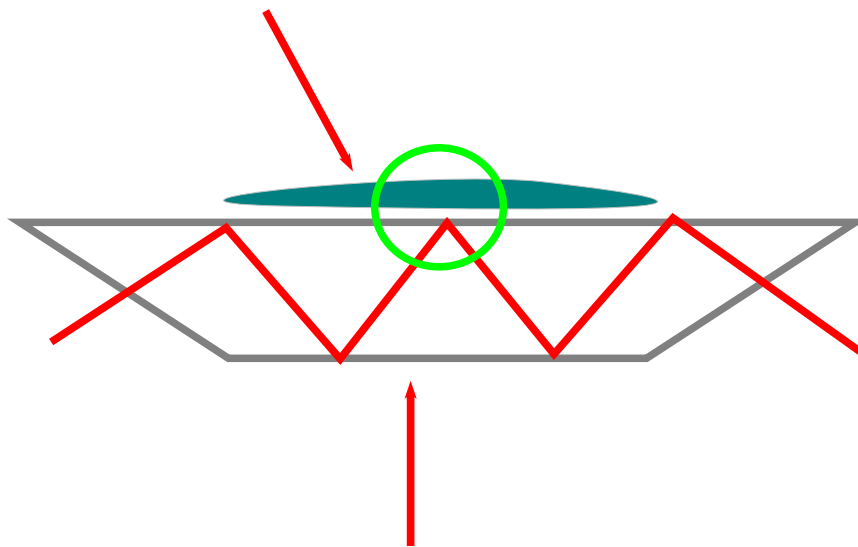
- ⇒ Baserar sig på att ir-ljuset totalreflekteras i en kristall
- ⇒ Känner av provet endast på 1 μm djup på andra sidan av kristallens yta.
- ⇒ Speciellt bra för ytanalytik.
- ⇒ Kräver matematisk efterbehandling av spketret.



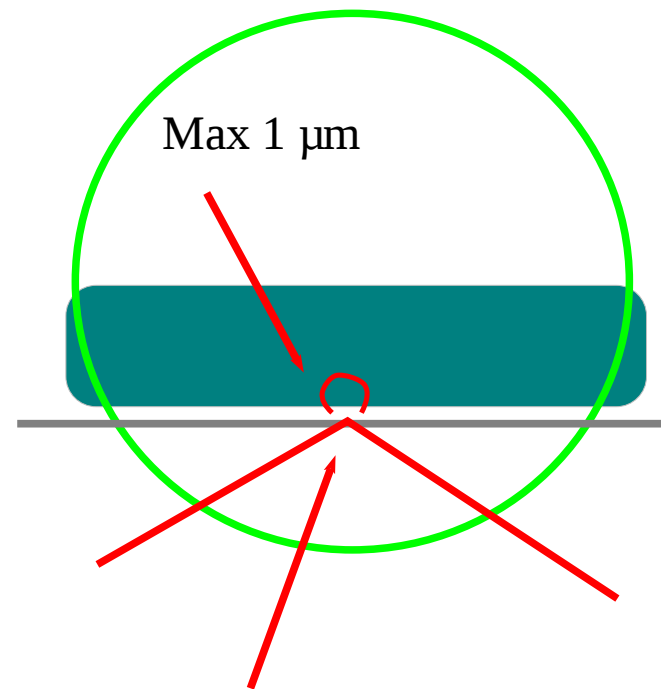
ATR

Schematiskt

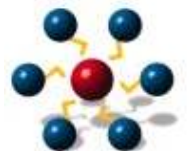
Prov: Pulver, fibrer,
vätska, ...



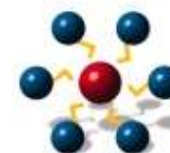
Kristall: Ge eller ZnS



Total reflektion



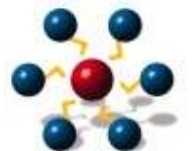
ATR



DR

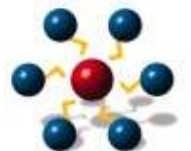
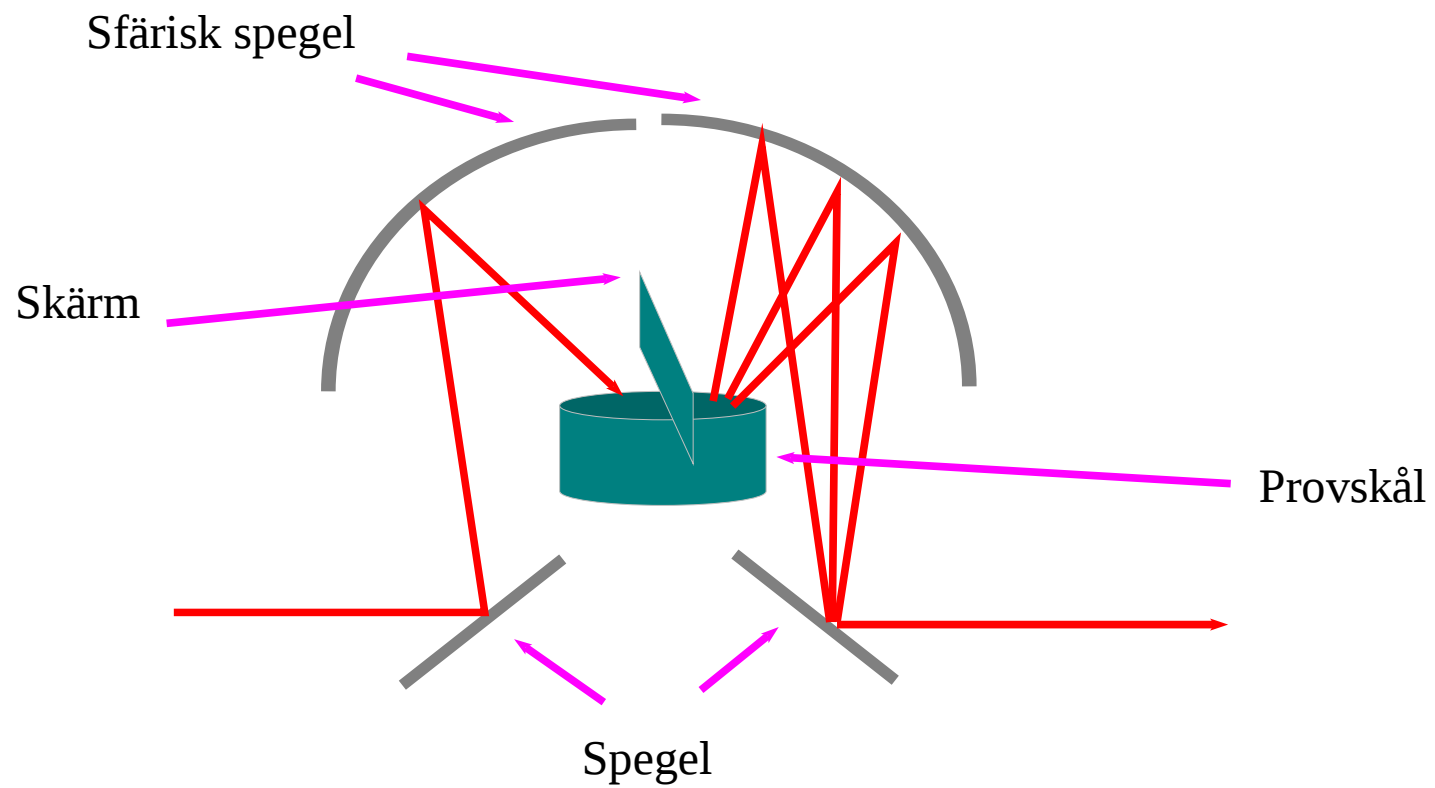
Diffuse reflectance

- ⇒ Kallas även DRIFT (diffuse reflectance infrared Fourier Transform spectroscopy)
- ⇒ Endast för pulverprov
- ⇒ Reflektioner från pulverpartiklarnas yta. => Ytanalytik.
- ⇒ Kräver matematisk efterbehandling av spektret.



DR

Schematiskt



Diffus reflektans (DR)

Sfärisk spegel på insidan

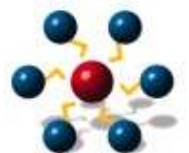
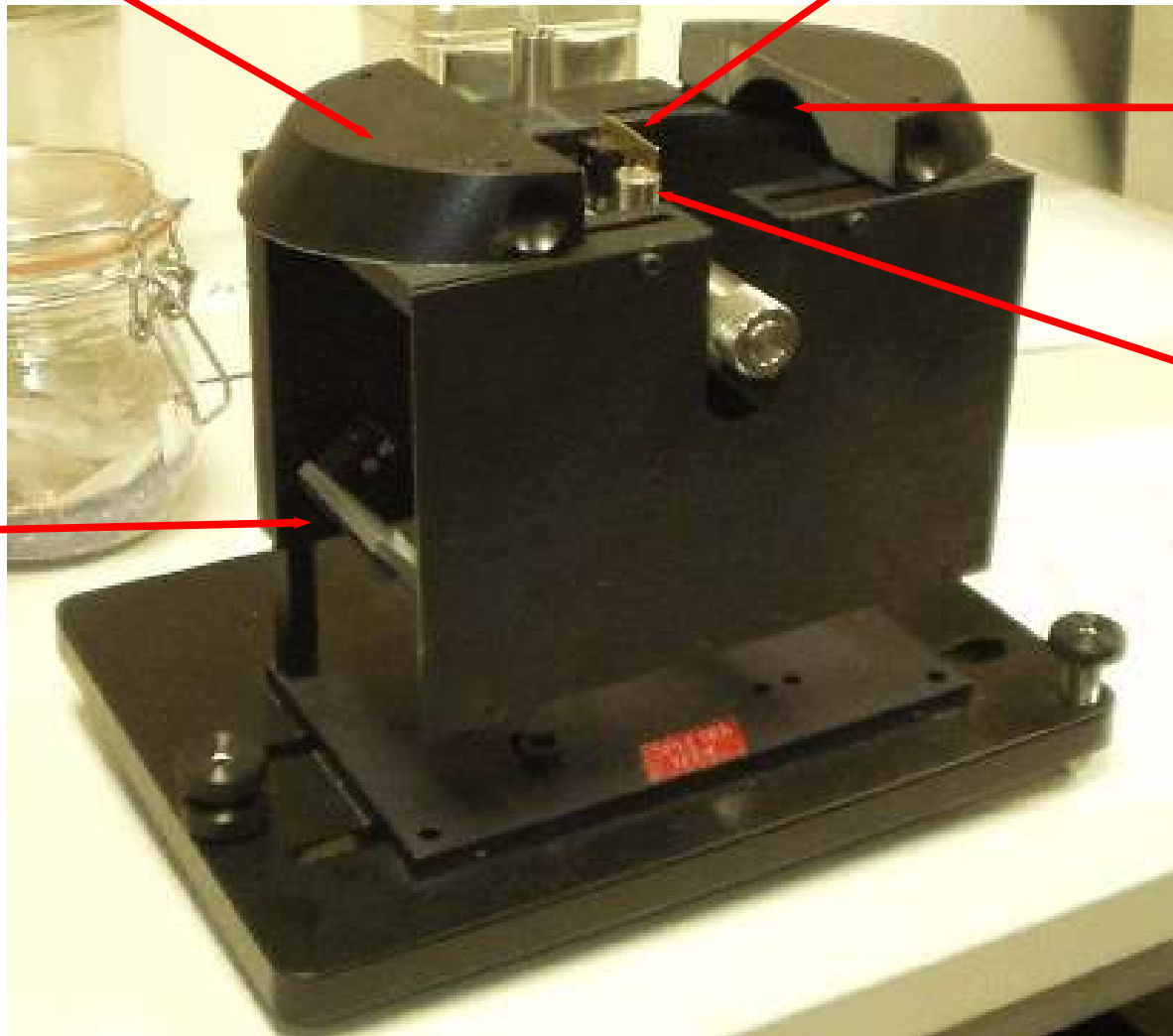
DRIFT

Skärm

Sfärisk spegel

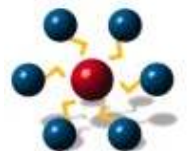
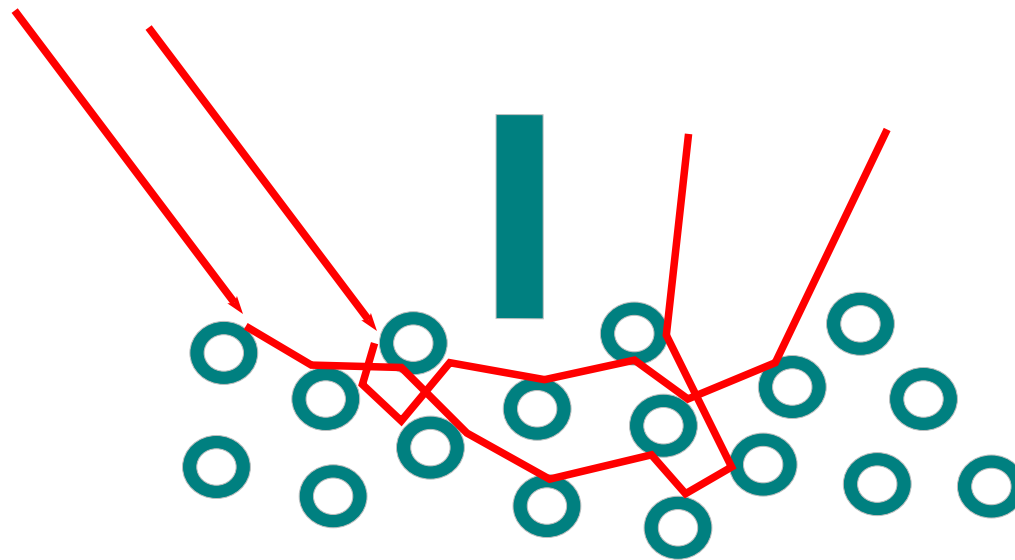
Provskål

Spegel



DR

Diffusa reflektioner i provet



PAS

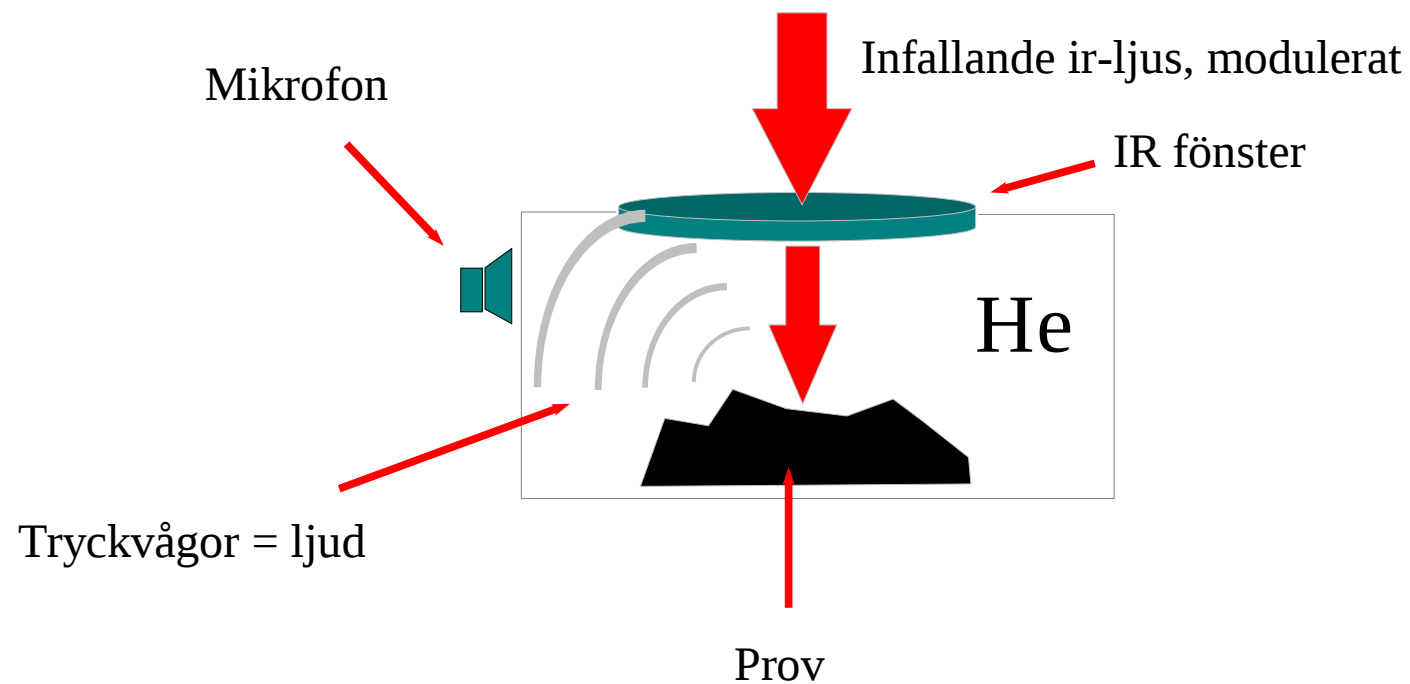
Photoacoustic spectroscopy

- ⇒ För riktigt besvärliga prov
- ⇒ Används då inte någonting annat lyckas



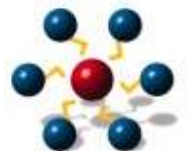
PAS

Schematiskt



Övriga tekniker

- ⇒ GC-IR
- ⇒ RAIRS
- ⇒ Matrisisolering
- ⇒ Tracer
- ⇒ Gas analys



GASMET gas analysator

Temet instruments

GASMET Dx-4015



[Http://www.gasmet.fi](http://www.gasmet.fi)

