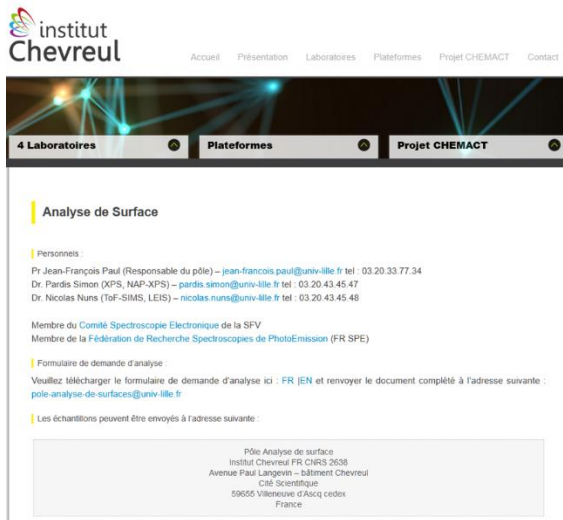


# X-Ray Photoelectron Spectroscopy

## Samples handling

Surface Analysis | [pardis.simon@univ-lille.fr](mailto:pardis.simon@univ-lille.fr)

- **Identify your need of an XPS Analysis**  
Is XPS appropriate for what you are looking for?
- **Prepare an analysis form**  
Download it on the website
- **Come and discuss with us!**
- **Selection of samples of interest**  
The less the better!



institut Chevreul

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4 Laboratoires Plateformes Projet CHEMACT

### Analyse de Surface

Personnels :

Pr. Jean-François Paul (Responsable du pôle) – jean-francois.paul@univ-lille.fr tel : 03 20 33 77 34  
 Dr. Pardis Simon (XPS, NAP-XPS) – pardis.simon@univ-lille.fr tel : 03 20 43 45 47  
 Dr. Nicolas Nuns (ToF-SIMS, LEIS) – nicolas.nuns@univ-lille.fr tel : 03 20 43 45 48

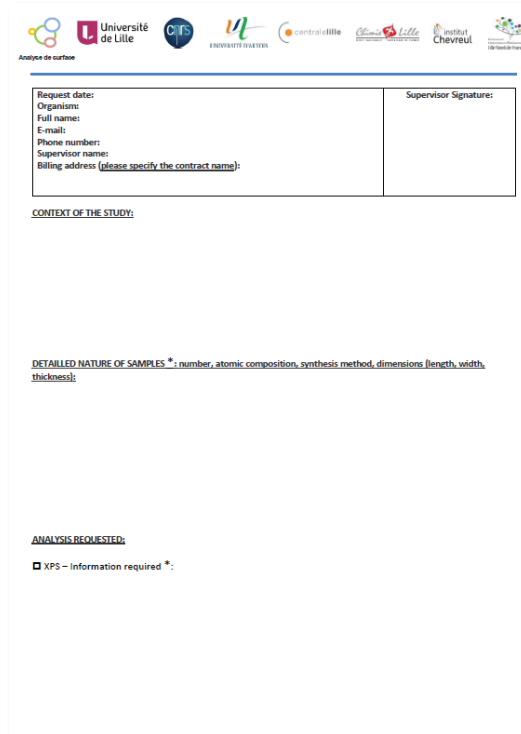
Membre du Comité Spectroscopie Electronique de la SPV  
 Membre de la Fédération de Recherche Spectroscopies de PhotoÉmission (FR SPE)

Formulaire de demande d'analyse :

Veuillez télécharger le formulaire de demande d'analyse ici : FR JEN et renvoyer le document complété à l'adresse suivante :  
 pôle-analyse-des-surfaces@univ-lille.fr

Les échantillons peuvent être envoyés à l'adresse suivante :

Pôle Analyse de surface  
 Institut Chevreul FR CIRS 2638  
 Avenue Paul Langevin – bâtiment Chevreul  
 Cité Scientifique  
 59650 Villeneuve d'Ascq cedex  
 France



Analyse de surface

Request date:  
 Organism:  
 Full name:  
 E-mail:  
 Phone number:  
 Supervisor name:  
 Billing address (please specify the contract name):

Supervisor Signature:

CONTEXT OF THE STUDY:

DETAILED NATURE OF SAMPLES \* (number, atomic composition, synthesis method, dimensions [length, width, thickness]):

ANALYSIS REQUESTED:

XPS – information required \*

- **Ultra-high vacuum compatible samples**
- Samples can be all kind of solids, thin films, powders, fibers, porous solids, foams...; but also ionic liquids with low vapor pressure (below  $10^{-10}$  mbar)...
- Conductors, insulators, ceramics, alloys, polymers, organic materials... can be analyzed by XPS

## Two rules:

- **Avoid contamination** as XPS is surface sensitive!

During each step: handling, sample storage, exposure to the atmosphere, preparation for analysis

- **Maximize electrical contact with analyzer** to avoid charging effect

Properly mounting the samples for analysis to create a constant surface potential

## Sample handling, preparation and mounting for XPS and other surface analytical techniques

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**Note:** This paper is part of the Special Topic Collection on Reproducibility Challenges and Solutions.

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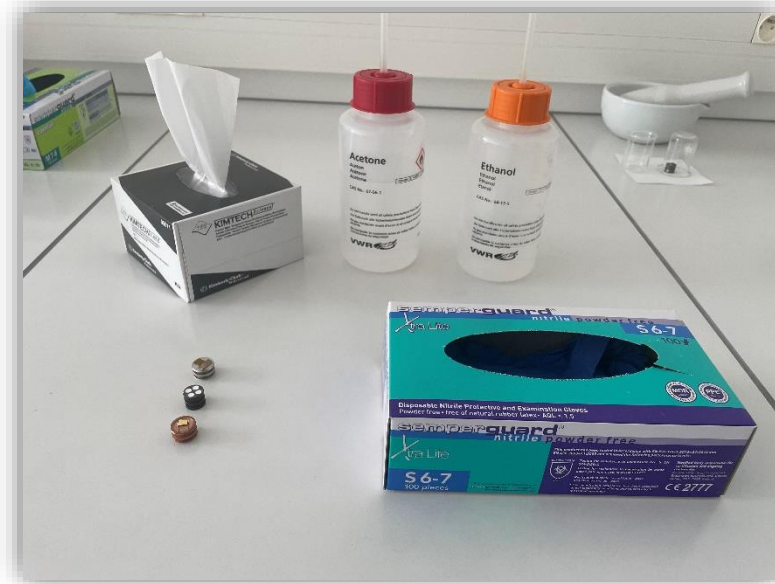
## Avoid contamination

- Store the samples in **small glass** vial or wrap them in aluminum foil – **avoid plastic**, high risk of carbon or siloxane contamination
- For sample sensitive to air or humidity, store in Ar filled air tight container
- ➔ Possibility to introduce the samples in the UHV chamber with a glove bag filled with N<sub>2</sub>.
- Samples **must be dry** – analysis is performed under UHV



## Avoid contamination

- Clean all the tools and sample holder with **acetone first then ethanol or isopropanol**
- Use **fiber-free** tissues
- **NEVER manipulate the samples with bare hands**, use nitrile or powder free/latex free gloves and don't touch sample surface with gloves or tweezers either, manipulate the edges
- For solids cut to the appropriate size with **clean, lubricants free tools** and protect the surface
- Blow the contamination particles **with dry air or N<sub>2</sub>**.



## Sample dimension

**Kratos Axis Ultra DLD Instrument** - Two types of sample holder adapted for solids and/or powders

- For solids cut to the appropriate size:

**Width, length < 4 cm ; Thickness < 4 mm**

- For powders or ionic liquids :

**A volume of ca 0.1 ml is needed**

# Maximize electrical contact

## Powders

## Solids

- Compressed in specific sample holder (compatible with ionic liquids)
- Double sided conductive tape (Copper or carbon)

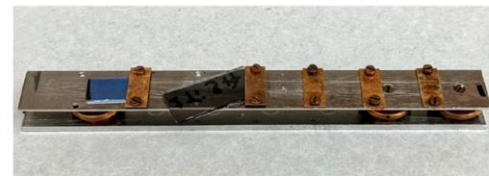
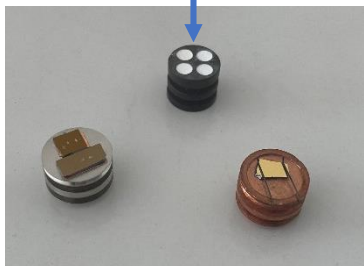
- Metallic clips or metallic fixation plates with screw to fix the samples on the sample holder
- Double sided conductive tape (Copper or carbon)

Ionic liquids

Free powders

Taped powders or solids

Fixed solids



Adapted for measurements with ToF-SIMS/LEIS/High T° gas Cell



Adapted for angle resolved measurement