Le profil professionnel des docteurs

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Cœur de métier

PHASE 2 **Développement des compétences**

During my first PhD year at IPCMS (University of Strasbourg), I combined scientific research on high-entropy alloy nanoparticles with professional development focused on industry-relevant skills in electron microscopy and electrochemistry. I designed and optimized TEM/STEM imaging and in situ liquid TEM protocols for multimetallic nanoparticles, systematically linked synthesis parameters to nanostructure, and evaluated reproducibility across multimetallic samples using SAED, STEM-EDX, and particle-size statistics. I set clear objectives to establish an in situ liquid TEM workflow for real-time observation of Particle growth while mastering ex situ electrochemical synthesis of Pt nanoparticles with controlled morphologies.

PHASE 1 **Évaluation**

During my first PhD year at IPCMS, I developed this skill by critically evaluating TEM/STEM, SAED, and STEM-EDX results to judge sample quality, compare multimetallic structures, and check whether synthesis conditions truly improved morphology or elemental mixing. I also presented my findings at conferences, where external questions helped me assess the added value of my work and refine my interpretation of Pt and high-entropy alloy nanoparticles.

PHASE 2 **Gestion de l'information**

In my first year at IPCMS, I organized and compared reports, and experimental data to select the most relevant information for my work on Pt and multimetallic nanoparticles, while structuring microscopy images, electrochemical results, and SAED/EDX datasets to ensure traceability, reproducibility, and safe archiving.

PHASE 2 **Expertise et méthodes**

I developed skill by taking ownership of advanced electron microscopy and electrochemical methods for multimetallic nanoparticles, from ex situ Pt synthesis to in situ liquid TEM observation. I learned to frame complex questions about how deposition conditions shape morphology and composition, then used SAED, STEM-EDX, and particle-size analysis to document and compare results. Presenting my work to specialists and discussing it with chemistry collaborators helped me adapt my arguments to different audiences.

Qualités personnelles et relationnelles

PHASE 2 **Communication**

Presenting my research at conferences and discussing it with chemists, microscopists, and non-specialists taught me to adapt my language to different audiences and contexts. Writing reports, presentations, and publication drafts also strengthened my ability to communicate clearly, while

working in multilingual research environments improved my confidence in professional exchanges.

PHASE 1 **Collaboration**

During my PhD, I built cooperative networks by working with researchers from different disciplines and by discussing results with external partners when comparing multimetallic nanoparticle synthesis and characterization strategies. These exchanges helped me understand the benefits and limits of collaboration, align shared objectives, and identify where different priorities or expertise could complement each other.

PHASE 1 **Analyse, synthèse et esprit critique**

During my PhD, I strengthened this skill by analyzing TEM/STEM, SAED, and STEM-EDX results to compare Pt and multimetallic nanoparticles, identify trends in morphology and elemental distribution, and judge whether synthesis conditions truly improved the outcome. I learned to sort information according to the scientific question, synthesize key findings clearly, and revise my interpretation when the data supported an alternative explanation.

PHASE 1 **Ouverture et créativité**

Throughout my PhD, I developed this skill by moving between electrochemistry, electron microscopy, and multimetallic catalyst design, which required flexibility and a willingness to question assumptions. When standard approaches did not explain the results, I tested new deposition conditions and imaging strategies, and I adapted my thinking to the data. Working with international collaborators also helped me adjust to different working styles and scientific perspectives.

PHASE 2 **Engagement**

Throughout my PhD, I developed this skill by staying committed to long experimental workflows, from optimizing Pt nanoparticle synthesis to building an in situ liquid TEM approach for multimetallic systems. I kept working through technical setbacks, adapted my methods when results were not as expected, and supported colleagues by sharing practical solutions and experience.

PHASE 2 **Intégrité**

During my PhD, I developed this skill by handling research data carefully, respecting confidentiality when working with shared results, and making sure publications and presentations reflected the work accurately. I also learned to think about what could be disclosed and when, especially when results were part of ongoing collaborative projects.

PHASE 2 **Équilibre**

Throughout my PhD, I developed this skill by managing demanding experimental periods, technical setbacks, and long timelines while keeping my work organized and my priorities clear. I learned to stay calm under pressure, use my strengths to move forward when experiments failed, and maintain a clear boundary between research time and personal time.

PHASE 2 **Écoute et empathie**

During my PhD, I developed this skill by working in multidisciplinary settings where it was important to listen carefully to different viewpoints, understand colleagues' experimental constraints, and adapt my explanations to their needs. I also learned to acknowledge others' contributions and support them when technical difficulties created stress.

Gestion de l'activité et création de

PHASE 1 **Conduite de projet**

valeur

During my PhD, I developed this skill by planning complex experimental work on Pt nanoparticles and multimetallic systems around the availability of TEM/STEM instruments, electrochemical setups, and sample preparation constraints. I had to prioritize tasks, adapt quickly when results or conditions changed, and keep the work aligned with project goals and deadlines.

PHASE 2 Gestion des risques

During my PhD, I developed this skill by identifying the main risks linked to electrochemical synthesis and in situ TEM work, such as beam effects, sample loss, bubble formation, and equipment limitations. I reduced these risks by preparing protocols carefully, checking experimental conditions before runs, and adapting the workflow when problems appeared.

PHASE 2 Prise de décisions

During my PhD, I developed this skill by choosing between synthesis and characterization options under limited time and instrument availability, and by accepting that the best scientific choice was not always the most technically ambitious one. When results did not meet expectations, I revisited the conditions, adjusted the protocol, and moved forward with the most reliable solution.

PHASE 1 Production de résultats

During my PhD, I developed this skill by turning research ideas into validated experimental workflows, from ex situ Pt nanoparticle synthesis to the first in situ liquid TEM tests on multimetallic systems. I refined protocols through repeated trials, learned from each test, and selected publication as the main way to share results with the scientific community.

Stratégie et leadership

PHASE 1 Stratégie

During my PhD, I developed this skill by understanding how my work on multimetallic nanoparticles fits into the broader goals of advanced catalysis and electron microscopy, and by aligning my experiments with the priorities of the project and the expectations of collaborators. I learned to identify who could support the work, what each partner brought to the project, and how to present results in a way that matched their interests.

PHASE 1 Leadership

During my PhD, I developed this skill by taking initiative in the laboratory, coordinating my own experimental workflow, and sharing practical solutions with colleagues when technical issues arose. I learned to gain trust through reliability, clear communication, and consistent follow-up, which helped me build constructive working relationships and support collective progress on shared experiments.