

Recording experimental notes

2025/July/23th

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What to Note (Must)

- **Date, time of experiments.**
- **Detailed information of the sample**

At least, the detailed information of the sample should be recorded when installation, such as:

 - (i) Materials name, (ii) Doping concentration,
 - (iii) If the sample is provided by collaborator, where it is came from, etc.
- **Everything you did for the sample**

All the process you did for the sample such as:

 - (i) Cleavage, (ii) Annealing, sputtering, (iii) Deposition, (iv) Air exposure, etc.
- **All the parameters that is not automatically recorded in PC.**

Many of the parameter in STM measurement maybe automatically recorded in PC, so it is not necessary to note. Other parameters should be recorded in the experimental note such as:

 - (i) Temperature, (ii) Parameters of external lock-in, etc.
- **Everything you did for the system (chambers).**

Installation or removal of the equipment.
- **All the troubles and how it is solved.**

What to Note (Recommend)

- **Brief note of the purpose of experiments or scanning**

What is the purpose of experiments, what kind of data you want, what are you interested in?

- **Brief note of the result of the experiment**

How was the experimental result, is the surface good or bad?

- **Something interesting during the experiments**

Did you find anything unique during the experiment?

These can be deduced after the experiment even it is not noted. So, these are not must, but it helps your analysis in the future. Without these notes, sometimes you (or your colleague who watch the note) cannot remind or understand why you did it.

Notes for experimental note

- Sometimes the experimental note will be reviewed several years later, or even by others. Therefore, **the note should be recorded to be understandable for others.**
- We don't believe the human's memory (even myself). Therefore, "I remember" is not allowed for the experiments. **Everything you did should be proofed based on the record.**
- **When treating several samples at the same time, or performing a sample with several processes, clearly note it.** Especially, never forget noting the reset of sample condition (such by cleaving or cleaning).
- Sometimes the research is not going well, but this is OK, this is the research. However, our research is largely granted or supported by government, company, or university. **Therefore, we are responsible for recording and reporting what we did by their support.** Keep in mind that careful recording is the minimum requirement for the researcher (including students).

Examples and comments

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NbSe₂ → STM.
run TS P for prep.
22:01 clean Au(111)
A-2.93A(4.4V) 150V(26mA) 535°C 20min
0:18 retract tip, Au(111) $V_{pp}=6.88V$

NbSe₂ → STM

Clean Au(111)

Retract tip Au(111)

Is NbSe₂ scanned?
When Au(111) transferred
to STM?

2022.07.25
13:17 pumping locklock
19:12 Heat CoSe₂ 2.5A(3.3V) 2 hour
19:26 pumping prep.
2022.07.26
1:17 Approach tip
3:34 Retract tip $V_{pp}=2.44V$

Approach tip
Retract tip

On which sample?

Examples and comments

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14:35 retract tip $V_{pp} = 269V$ (WSe₂)
14:40 Au(111) → STM
heating FePc
 $I = 2.98A(8.5V)$ 1.43×10^{-9} torr 80 min
15:40 retract tip Au(111) $V_{pp} = 6.28V$
16:30 FePc on WSe₂ → STM (nothing)

Retract tip (WSe₂)

Heating FePc
80 min

Is FePc deposited on
WSe₂?

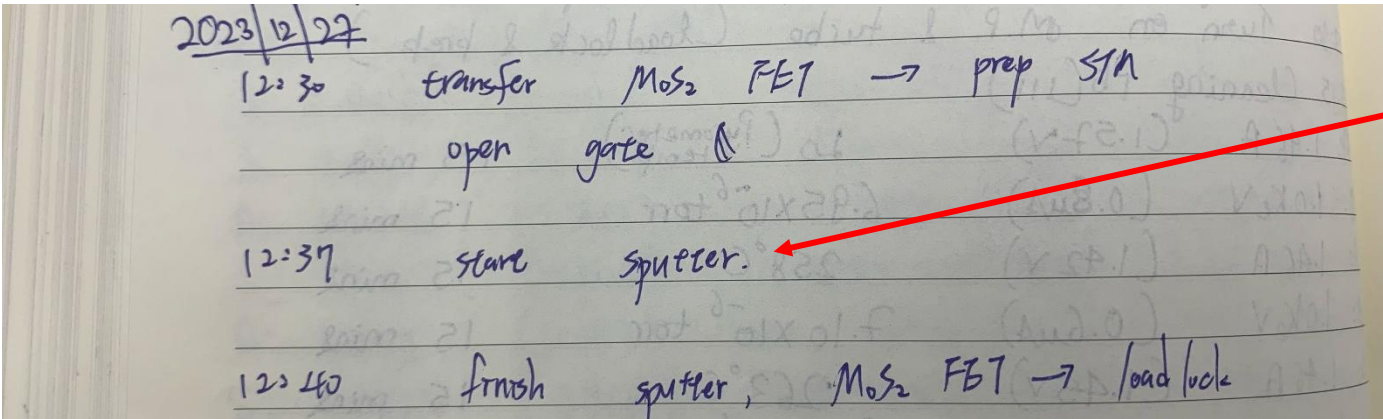
FePc on WSe₂ → STM

18:40 Ar⁺ bombardment treatment prepare. open M.
19:00 open turbo at prep.
19:30 Ar⁺ bombard (100 eV, 1×10^{-7} torr, 10 min)

Ar⁺ bombard

On which sample?

Examples and comments



Start sputter

On which sample?
What is the parameter?