Four-point probe spectral analysis method

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Background

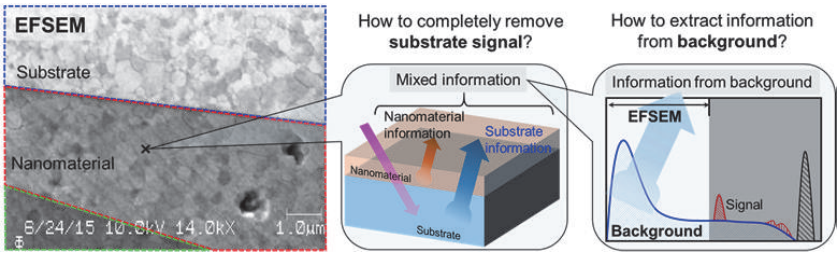
- Energy filtered scanning electron microscopy (EFSEM) is expected to investigate the passivation layer on stainless steel efficiently.
- The signals detected in EFSEM are generally regarded as background in most current existing data analysis approach, and can not provide any quantitative information.

Aim

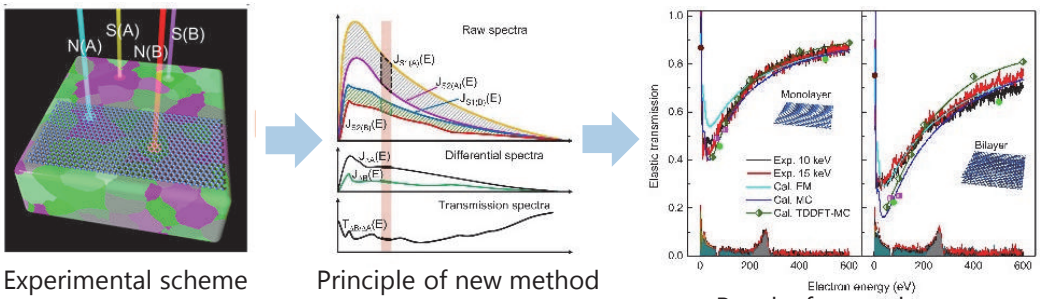
- We aim to develop a heuristic data-driven spectral analysis method to extract information of the passivation layer information from the measurements without the influence from underlying stainless steel substrate.

Advanced Research Topics

Problem: This problem in steel industry could be extended as how to study a substrate-supported nanomaterial sample using EFSEM, and further specified by problems.



Solution: We developed the four-point probe spectral analysis method.



Experimental scheme | Principle of new method | Results for graphene

Publications

- Bo Da et. al. Phys. Rev. Lett. **113** (2014) 063201-1-063201-5
- Bo Da et al. Nature Communications. **8** (2017) 15629-1-15629-9

Summary

- Representing a benchmark to provide 'free-standing' nanomaterial information from measurements of substrate-supported samples and does not demand extra investment in equipment.

Research outcome

- A new train of thought to extract meaningful information from background signals
- A software for implementing four-point probe spectral analysis method