A novel sensor for chalcogen vapour deposition monitoring and control

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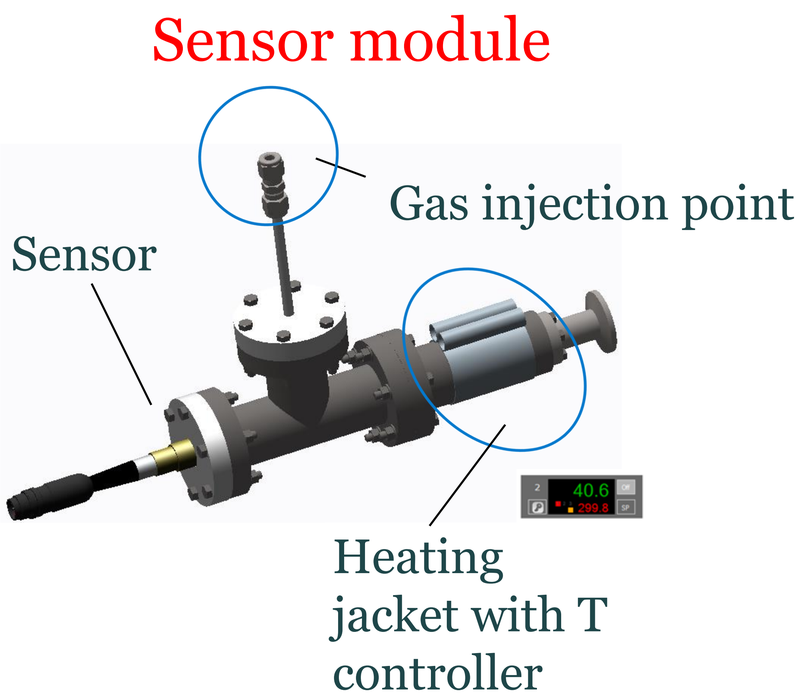
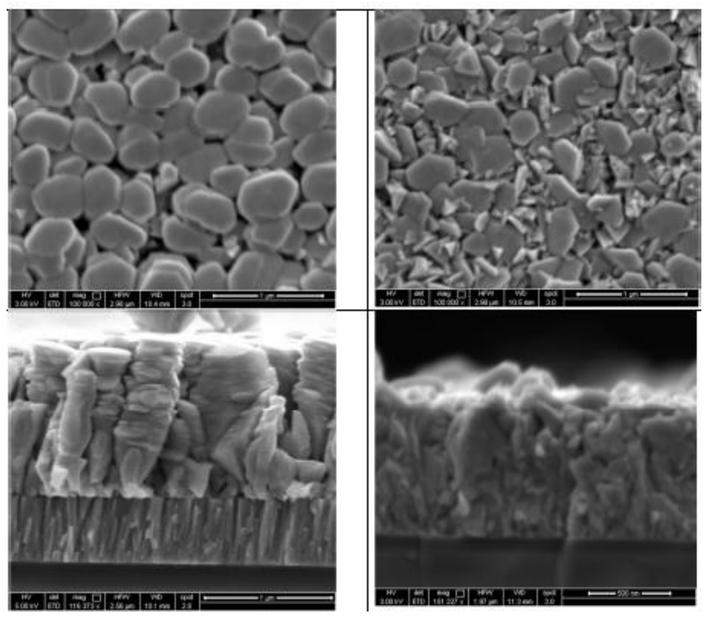
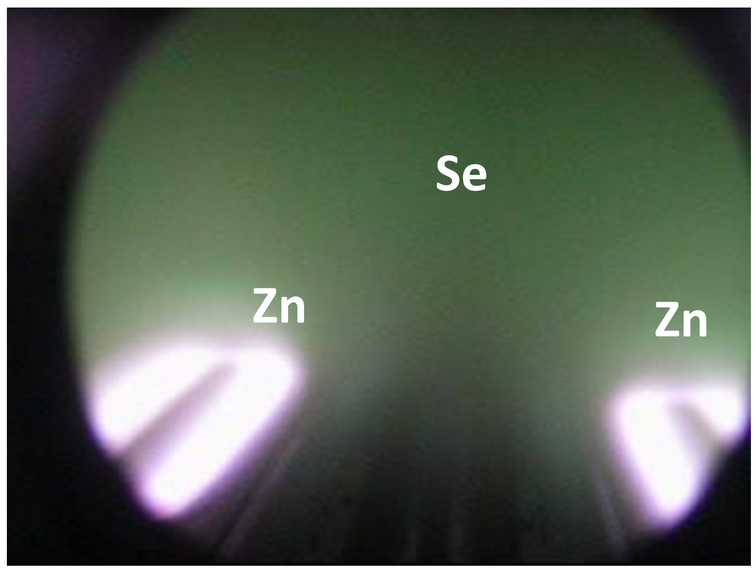
One of the most successful material for PV applications is CuInGa(Se,S), or CIGS, which is tipically produced via the selenisation (sulfurisation) of the CIG alloy. A feedback loop able to regulate the reactive vapour input in the process is extremely beneficial in terms of process control, material cost and waste management.





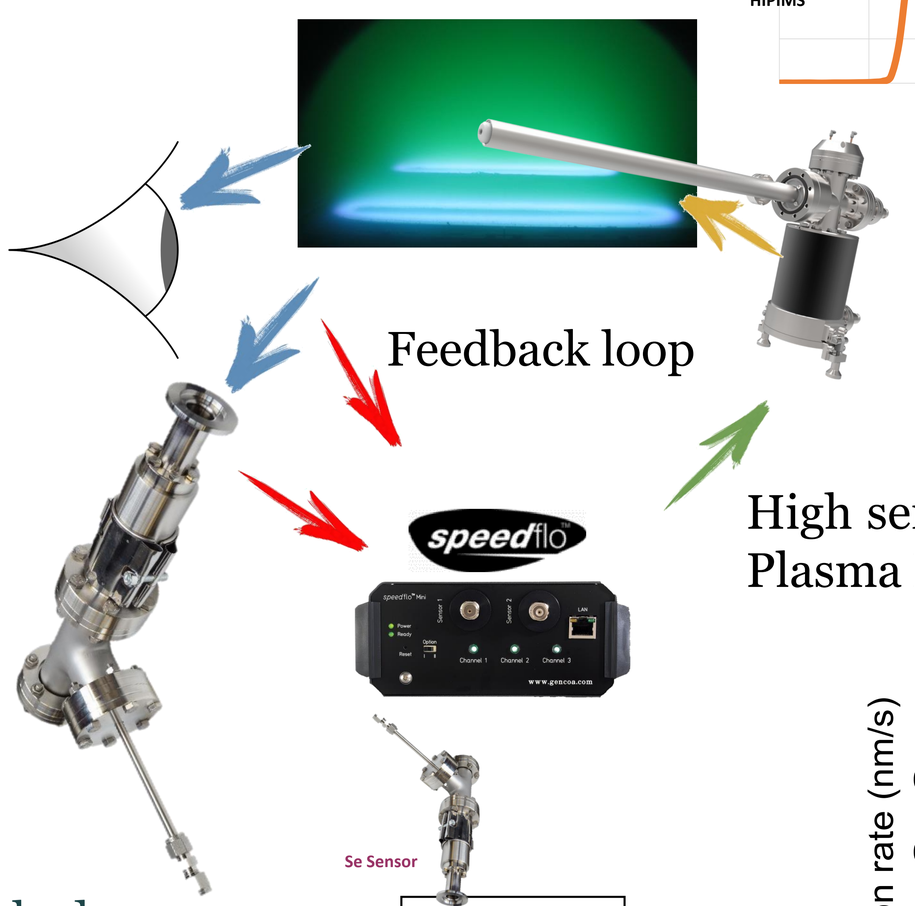
SEM micrographs of a ZnSe coating sputtered in reactive mode

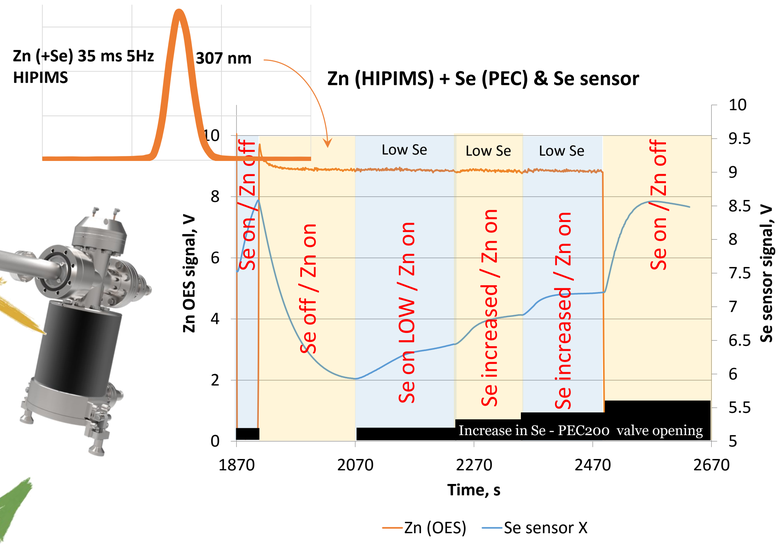


Plasma from Zn targets during reactive deposition with Se vapour

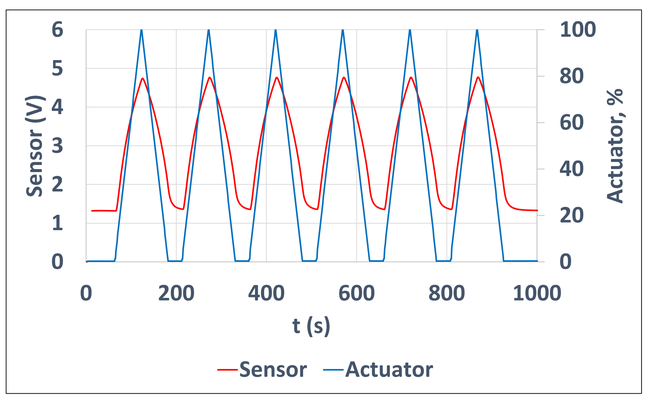
REACTIVE SPUTTERING

The authors of this presentation have developed and tested a new type of Se sensor for such application which is combined with a pulsed Se effusion cell and allows real feedback control regulation to maintain deposition conditions in a stable vapour pressure environment.



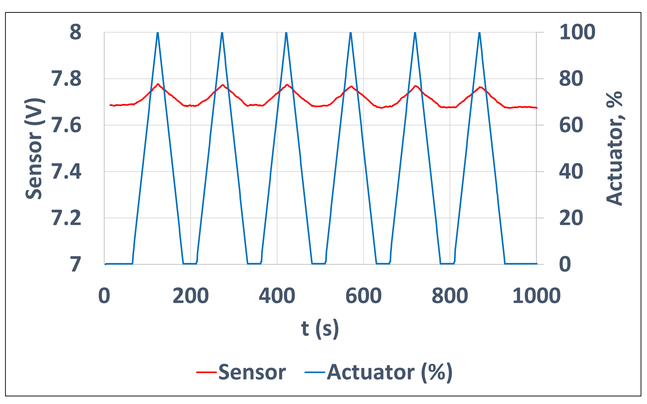


High sensitivity compared to Zn Plasma Emission Monitoring

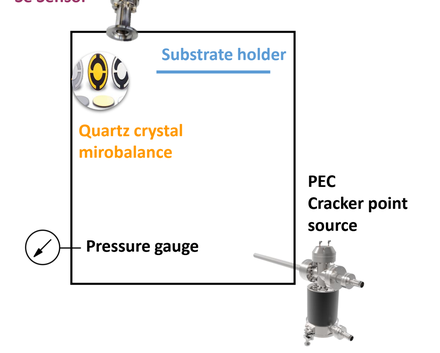


Module blanked

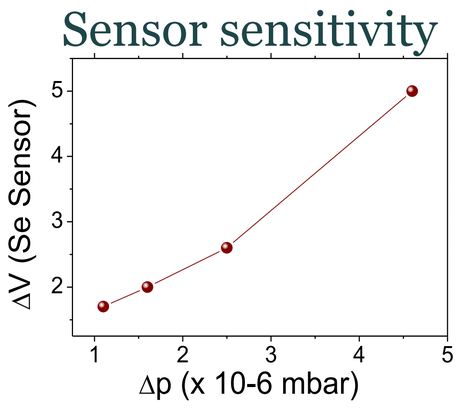
Adaptive sensitivity to low/high vapour pressure

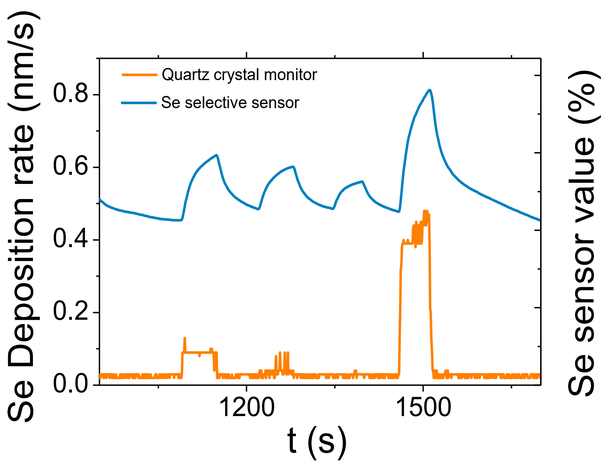


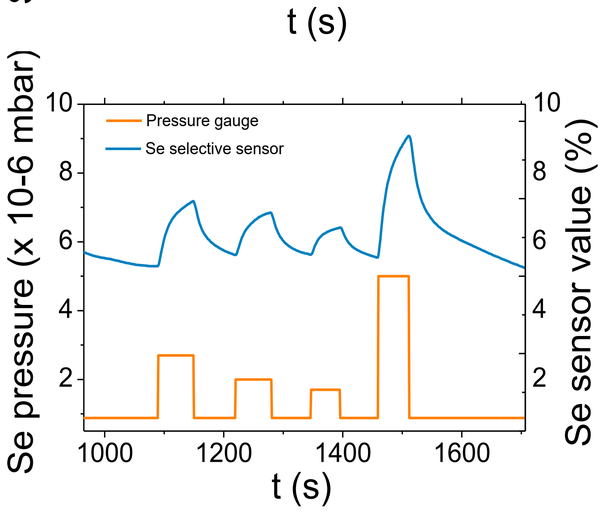
Module purged with gas (0.5 sccm)



Sensor sensitivity







EFFUSION