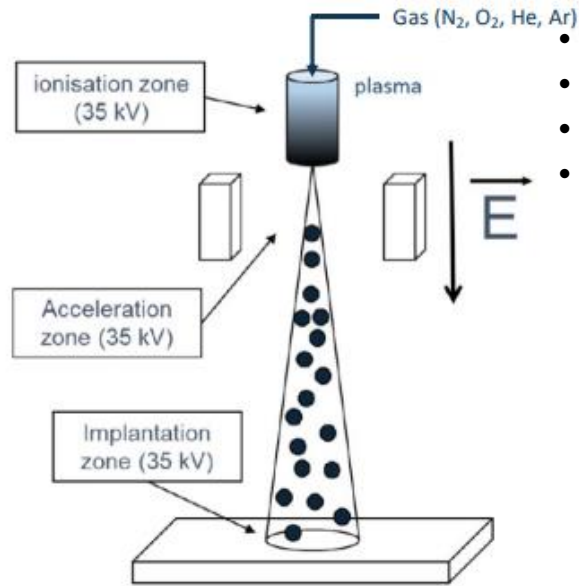


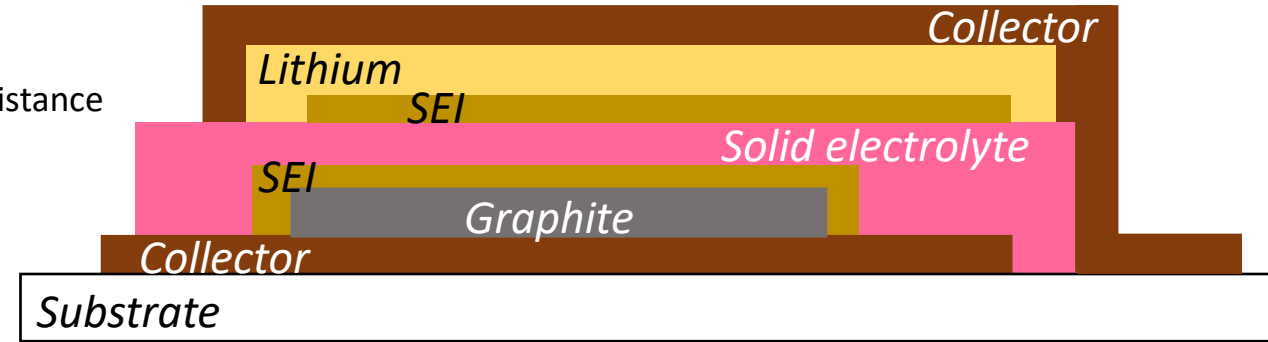
Monitoring material properties

- Surface hardening
- Improved corrosion and HT oxidation resistance
- Wettability modification
- Adhesion improvement at interfaces
- Enhancing barrier properties (polymers)
- Doping and allowing (oxides, nitride...)



Implanted species: all kind of gaseous compound
 Operating environment: high vacuum ($\sim 10^{-5}$ Torr)
 Energy range: 10 keV to 40 keV
 Dose (fluence): 10^{14} cm $^{-2}$ to 10^{18} cm $^{-2}$
 Near surface implantation: up to 500 nm

Reference device structure



TRL 2-4

Graphite electrode (cathode):

- Non-reactive implantation: Ne, Ar for monitoring vacancies in graphite
- Reactive implantation: N for doping

Solid state electrolytes:

Materials and fabrication methods: Li-PEO (Wet X) and LIPON (PVD)

Non-reactive ion implantation for monitoring ionic transport: Species: Ar, N, He, Ne
 Electrical characterization with impedance spectroscopy (Biologic, Modulab)

Li electrode (anode):

Deposition of Li layer (μ m) and additional interfacial thin film (LiF, MoS $_2$)
 Ion implantation for monitoring stability upon cycling
 Non-reactive implantation vs. Reactive implantation (H $_2$ S, CF $_4$)

Characterization of layers in half cells: electrical properties, capacity & energy, (de)charging time, stability in cycling