

Subject: Physical and chemical surface characterisation on TA6V coated with a biopolymer (chitosan) after several sterilization treatments (ethylene oxide, gamma rays, autoclaving, supercritical CO₂)

Techniques: XPS, Static ToF-SIMS

- ✓ Semi-quantitative analysis of surface elements
- ✓ Monitoring of characteristic fragments from the biopolymer and the substrate, with mapping
- ✓ Research of surface contaminations

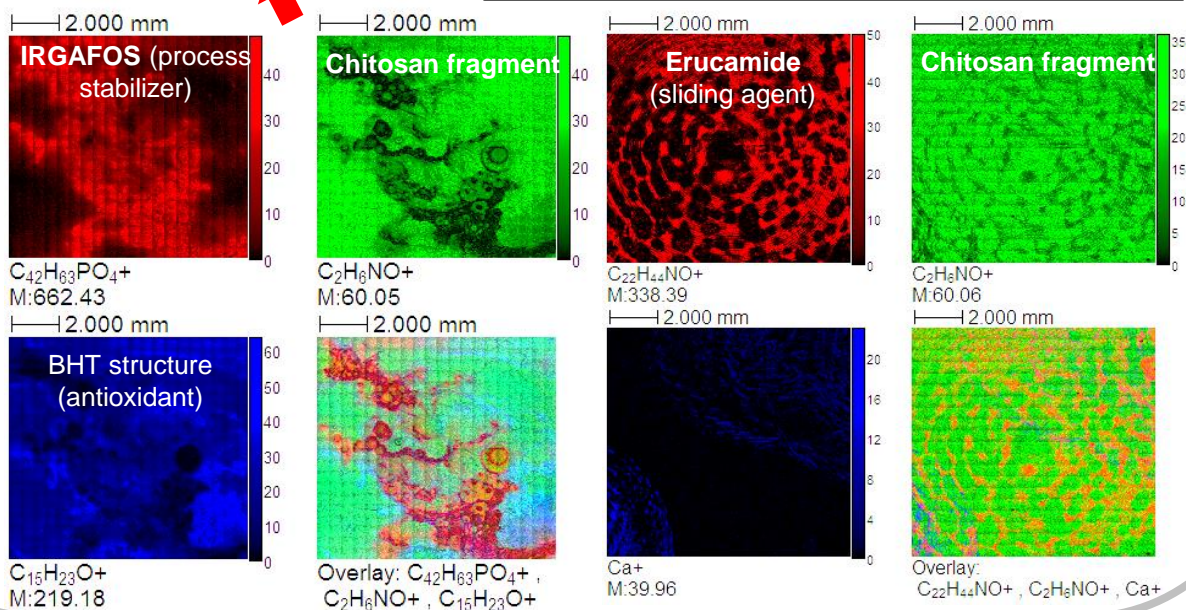
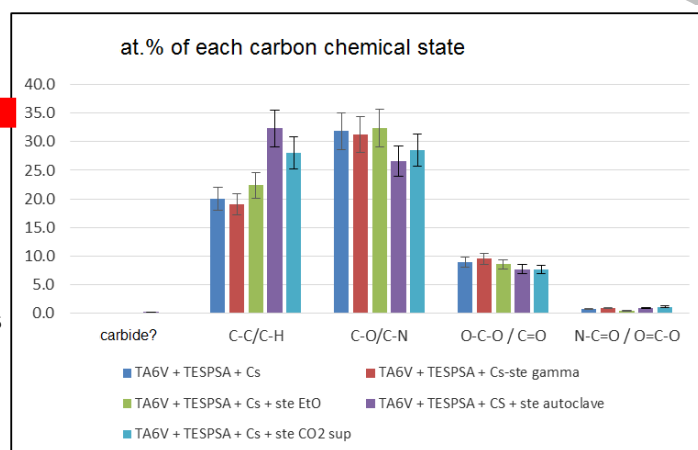
Results:

XPS:

- Detection of C, N, O (chitosan)
- after sterilization : increase of C, especially the C-C/C-H chemical state

ToF-SIMS:

- Detection of chitosan fragments: seems not damaged by sterilization
- But masking due to contaminations (polymer additives).



Conclusions:

Surface analyses by XPS and static ToF-SIMS do not evidence a biopolymer degradation but a strong carbonated (organic) contamination. The contamination is attributed to a transfer from the packaging (blister) during most of the sterilization processes.