



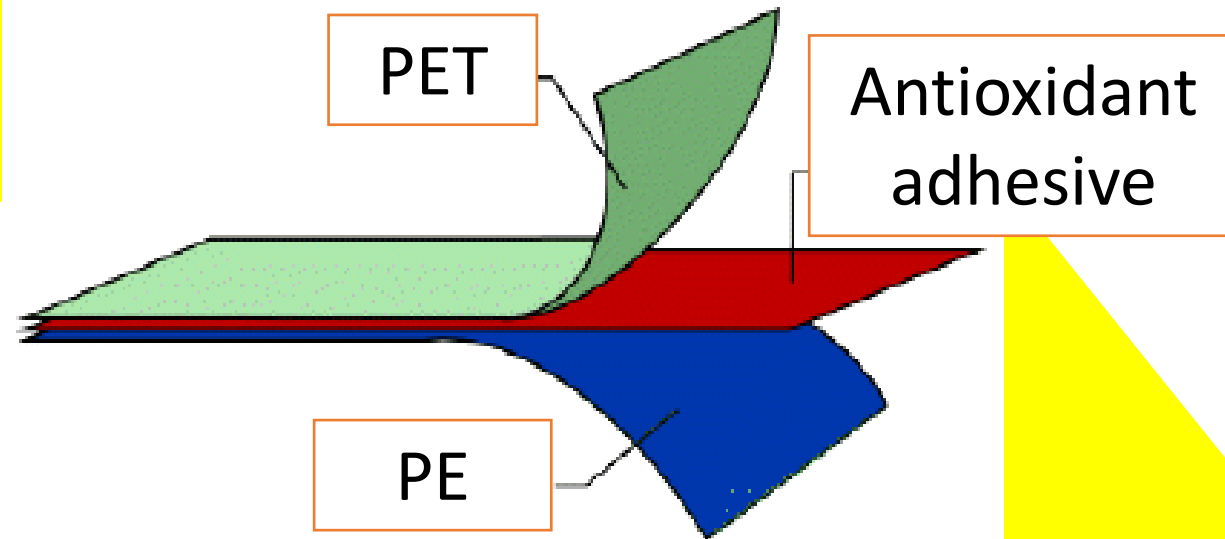
SAMTACK S.L.
Industrial adhesives

SmarTack®

Adhesives that increase shelf life of packaged food

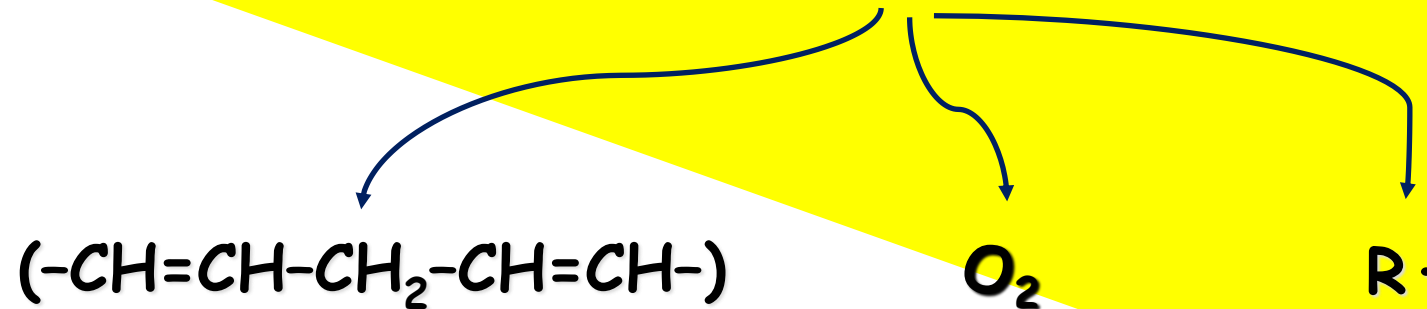
SmarTack®

Santack has developed a new adhesive technology for flexible multilayer complexes with antioxidant properties. Packaging manufactured with such multilayer films allows for an increased food shelf life.



How does it work?

Organic compounds oxidation

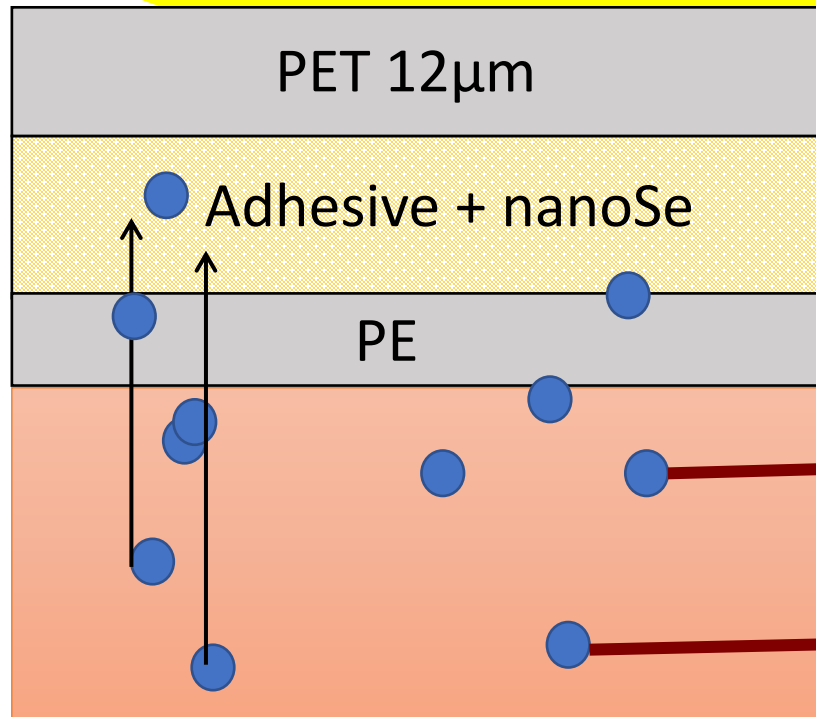


If one of the three components is eliminated, oxidation is prevented

How does it work?

Free radicals form spontaneously from oxygen, humidity and UV radiation. They rapidly promote oxidation reactions.

Free radicals cross the inner layer of the complex and reach the adhesive layer where Se nanoparticles act as radical scavengers.



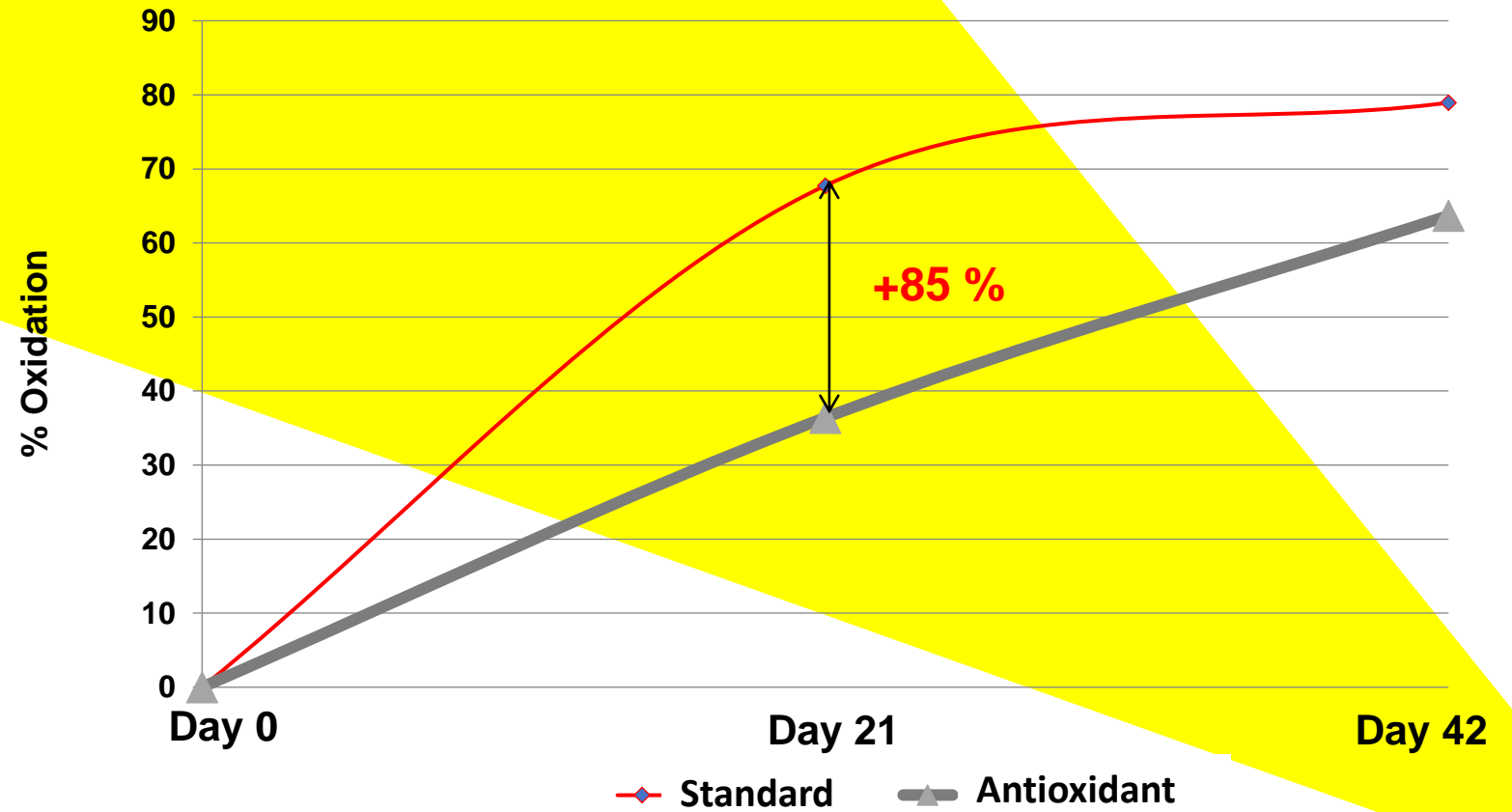
Free radicals:

- Oxo
- Hydroxo
- Peroxo

Results



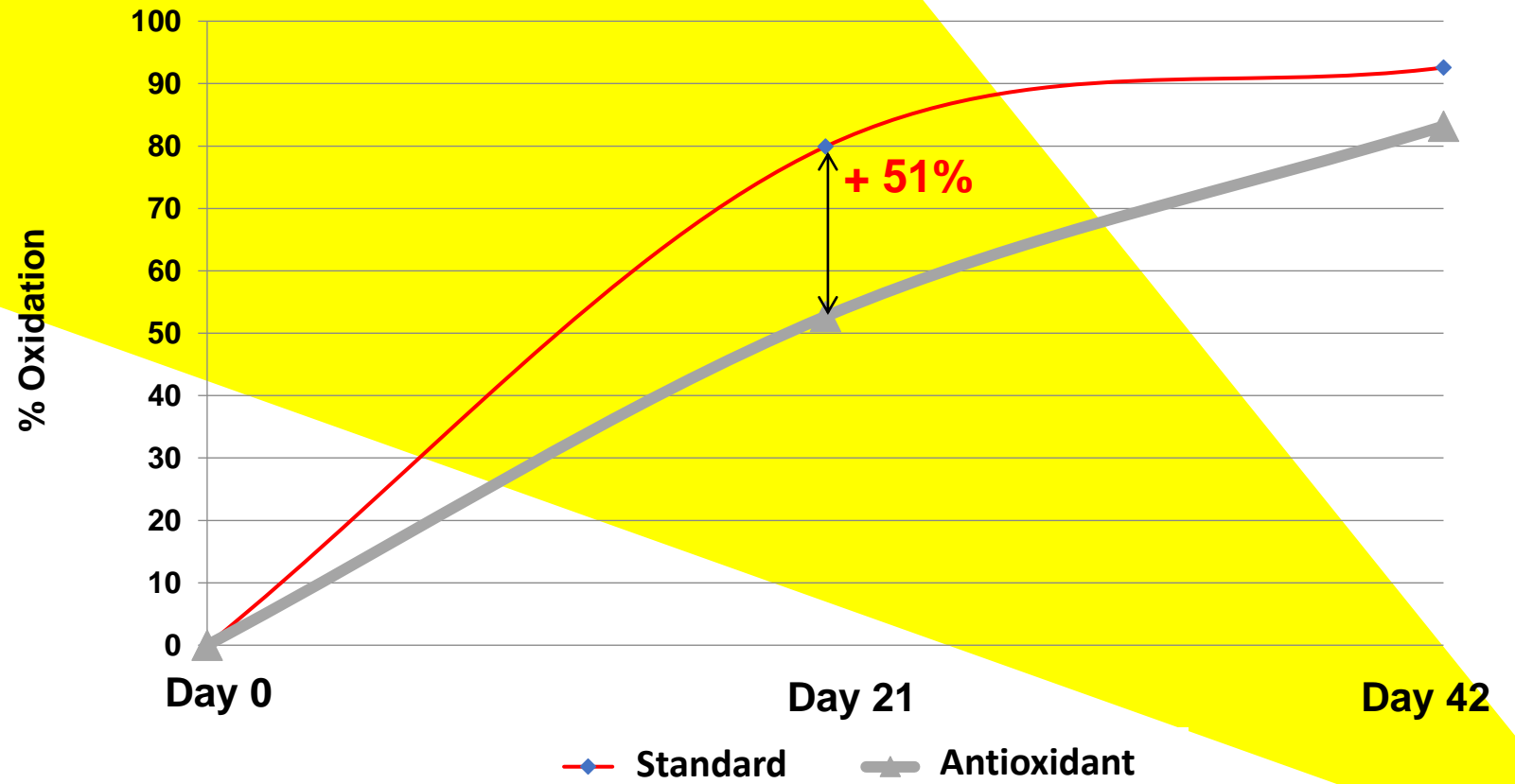
Hazelnuts (40 °C)



Results



Nuts (40 °C)



Results

TBARS Method:



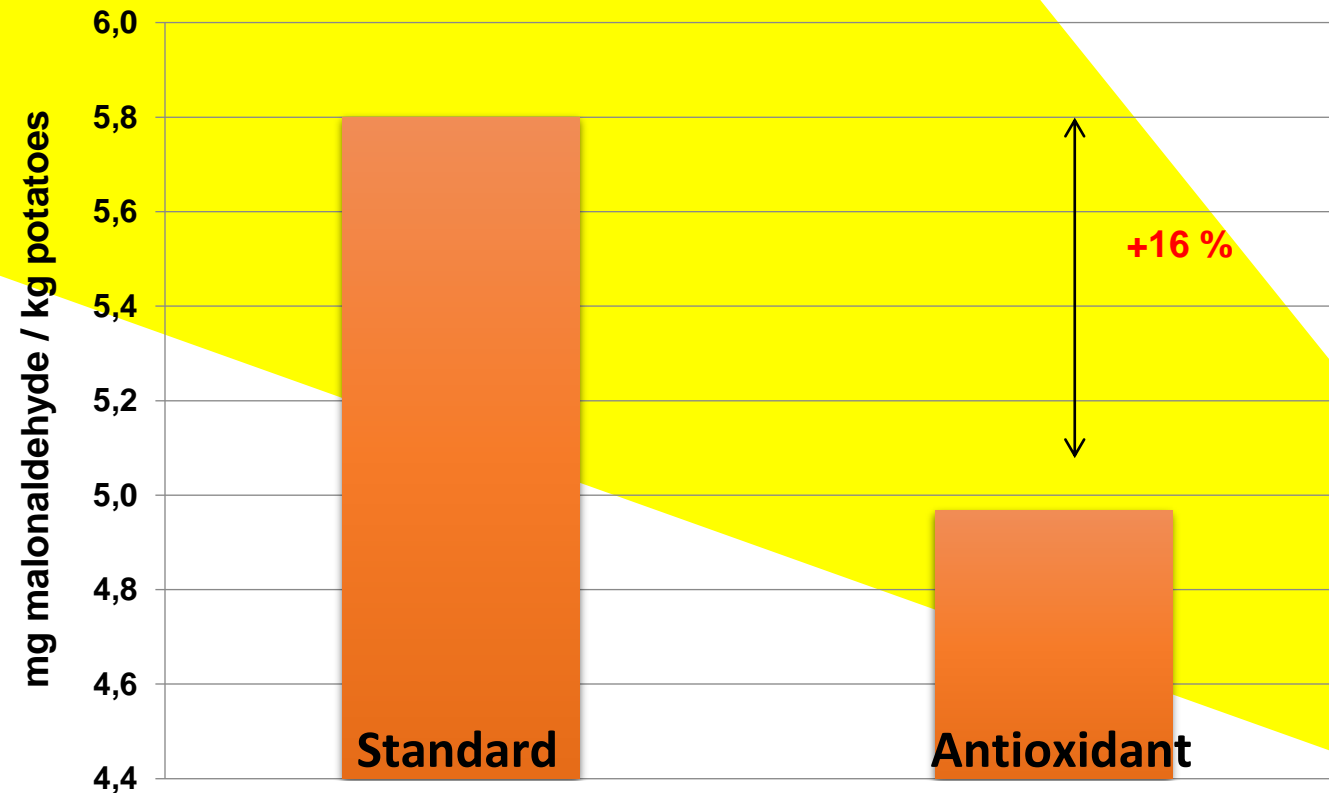
Malonaldehyde



Antioxidant properties



Chip potatoes (40 °C)



3 months after manufacturing of multilayer complex. 21 days at 40 °C.

Results

TBARS method:



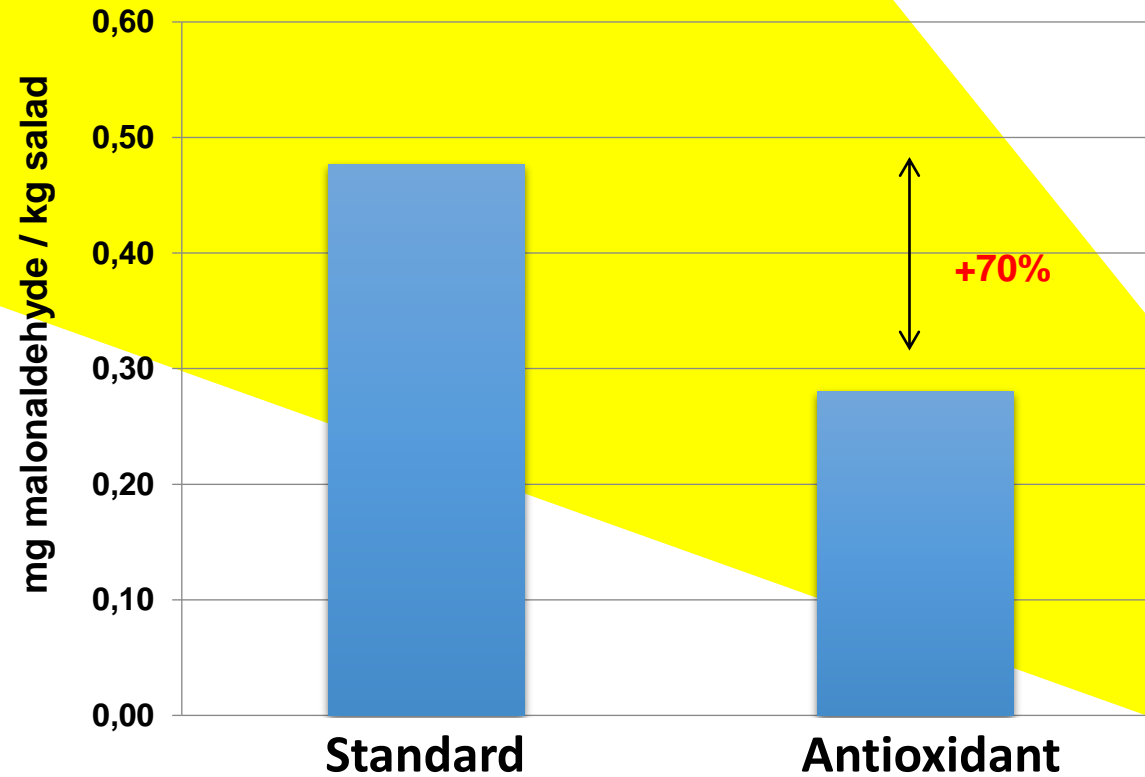
Malonaldehyde



Antioxidant properties



Vegetables salad (5 days; 6 °C)



Results

TBARS method:



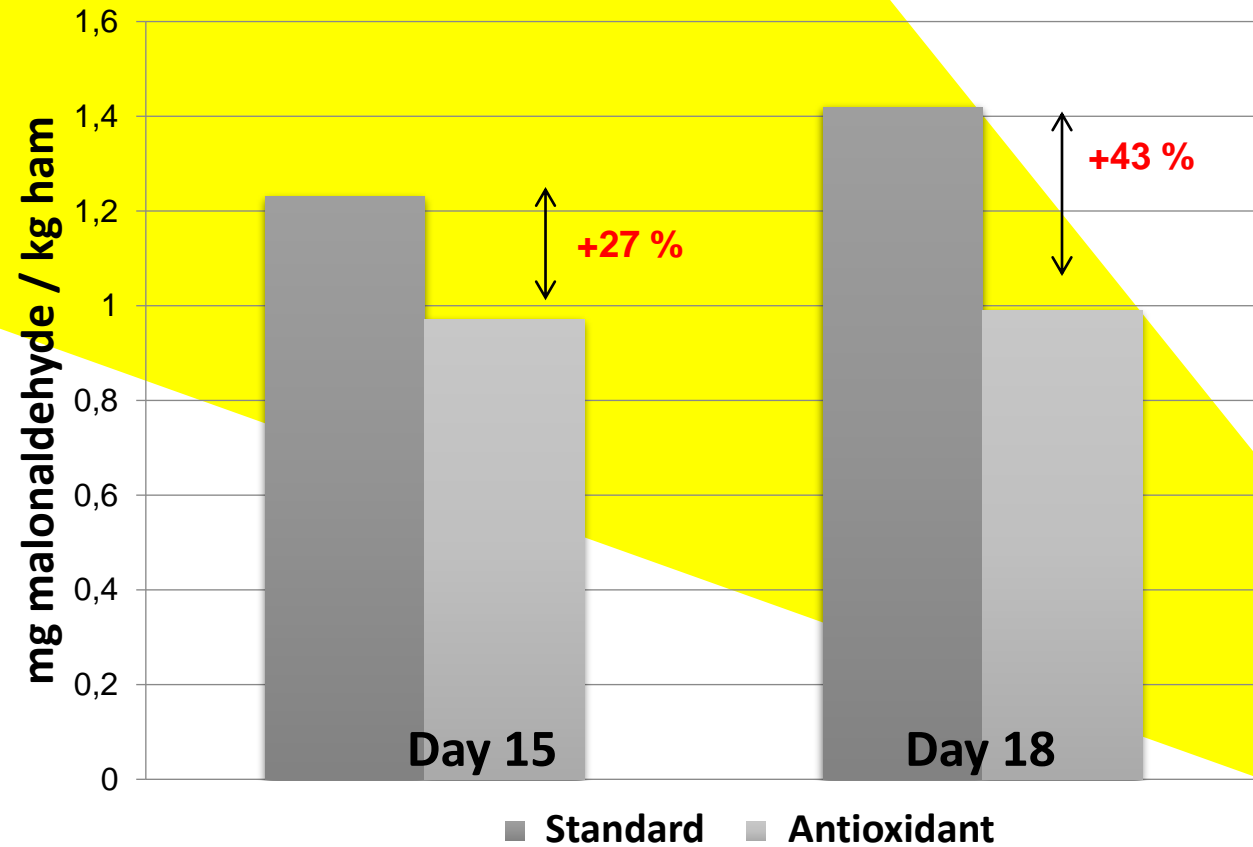
Malonaldehyde



Antioxidant properties



Cooked ham (6 °C)

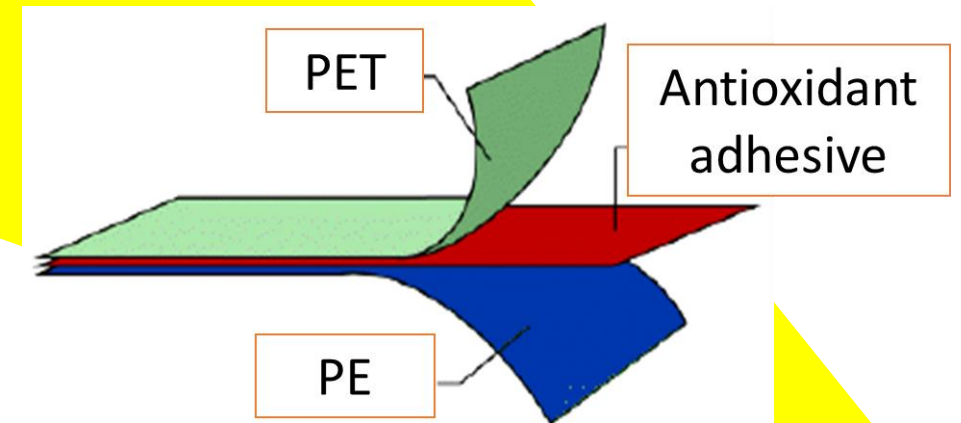


Synchrotron ???

Synchrotron ???

Process optimisation by studying Se oxidation state in

- **nanoSe additive**
 - **Wet adhesive**
 - **Dry adhesive in laminate**
- For being antioxidant → Se(0)**



Se oxidation state

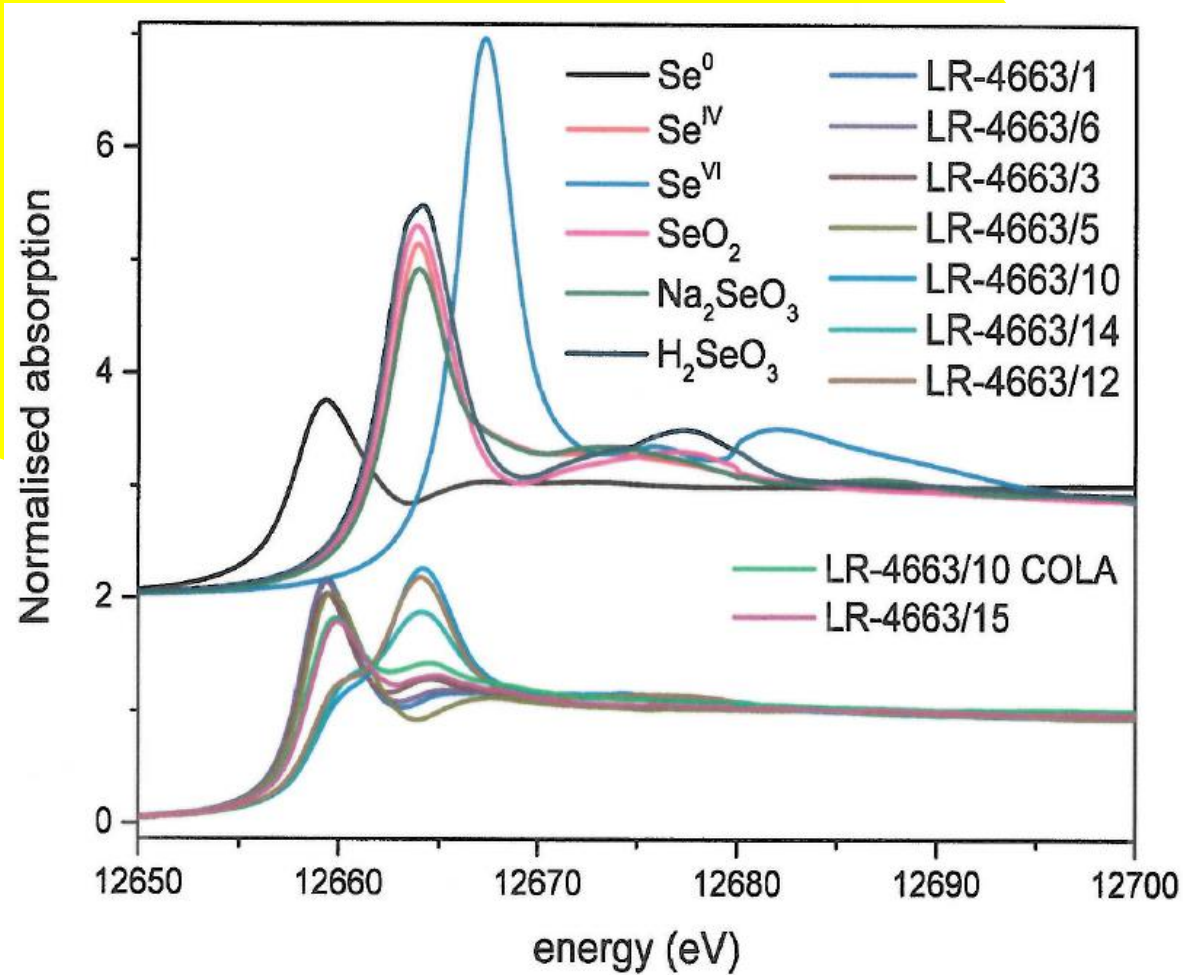


Fig1. XANES spectra at Se K edge of investigated samples together with reference compounds.

Se oxidation state

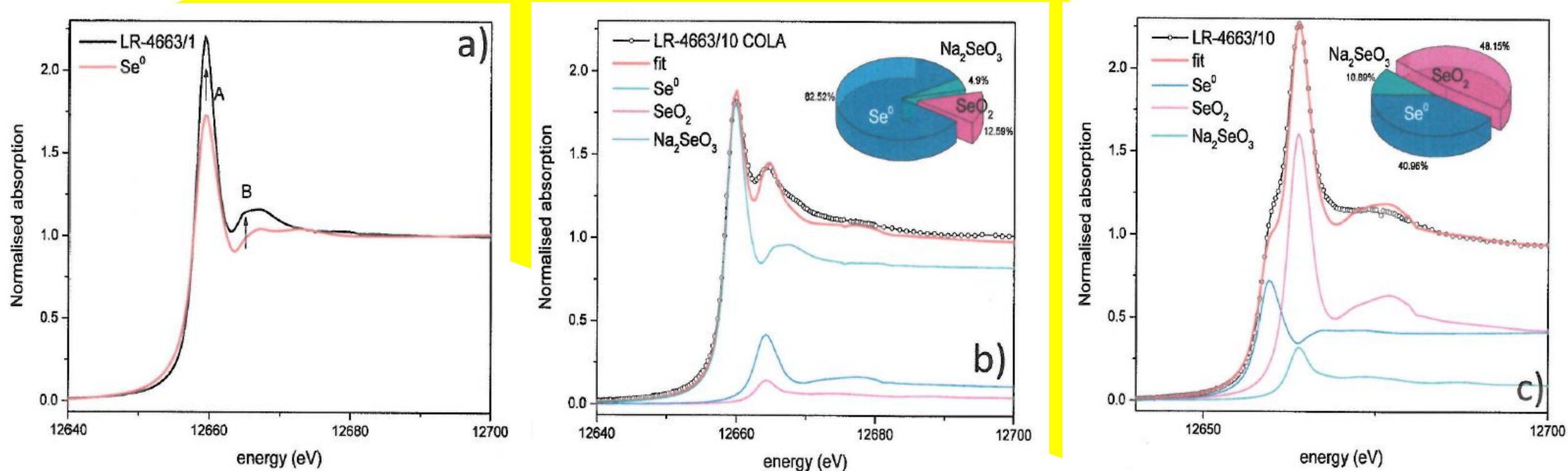


Fig2. Comparison between Se^0 (CLAESS reference) and LR-4663/1 (a). Linear combination fit of LR-4663/10 COLA (glue) and LR-4663/10 (plastic) (panel b and c respectively).

Se oxidation state

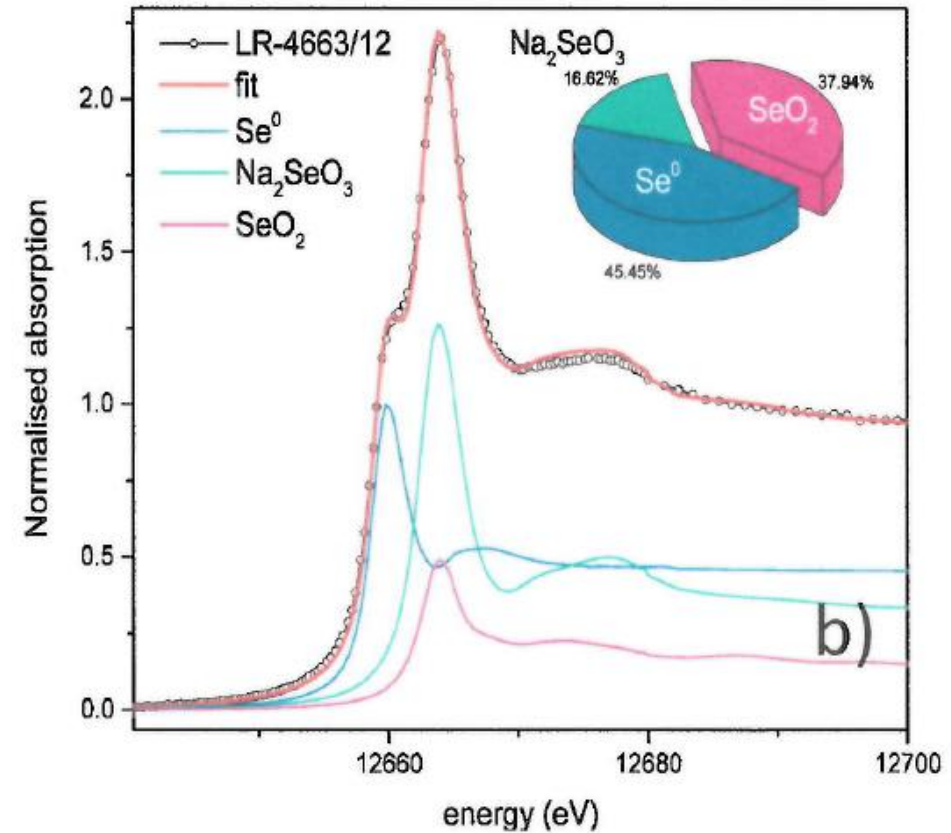
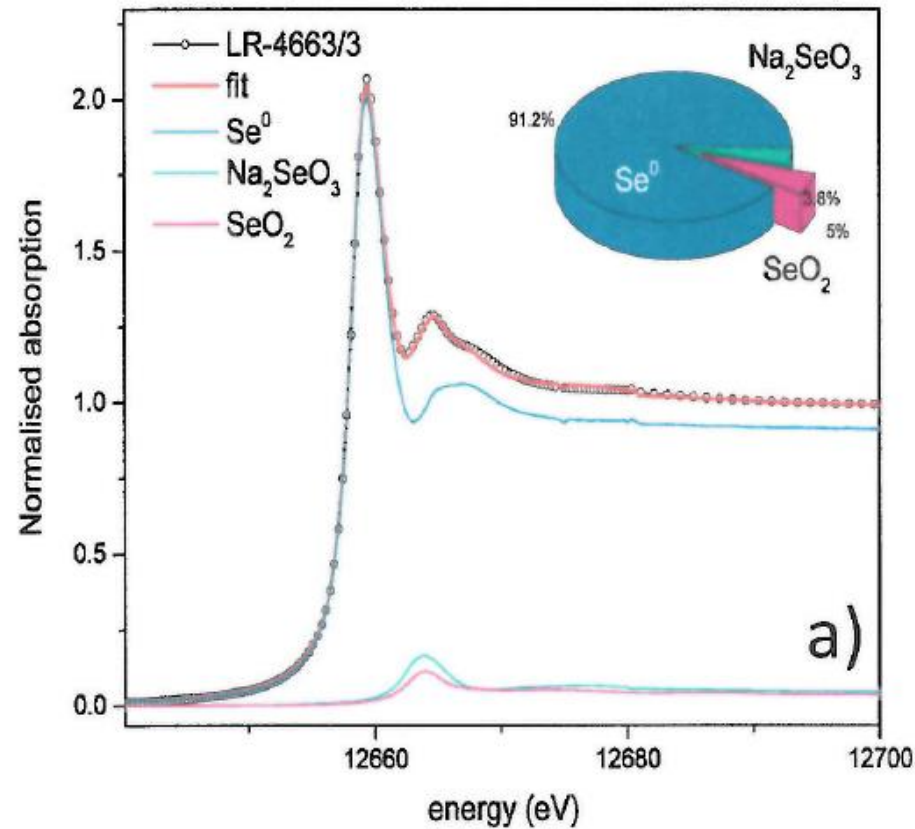


Fig3. (a) Linear combination fit of LR-4663/3 (suspension) and (b) LR-4663/12 (plastic)

Se oxidation state

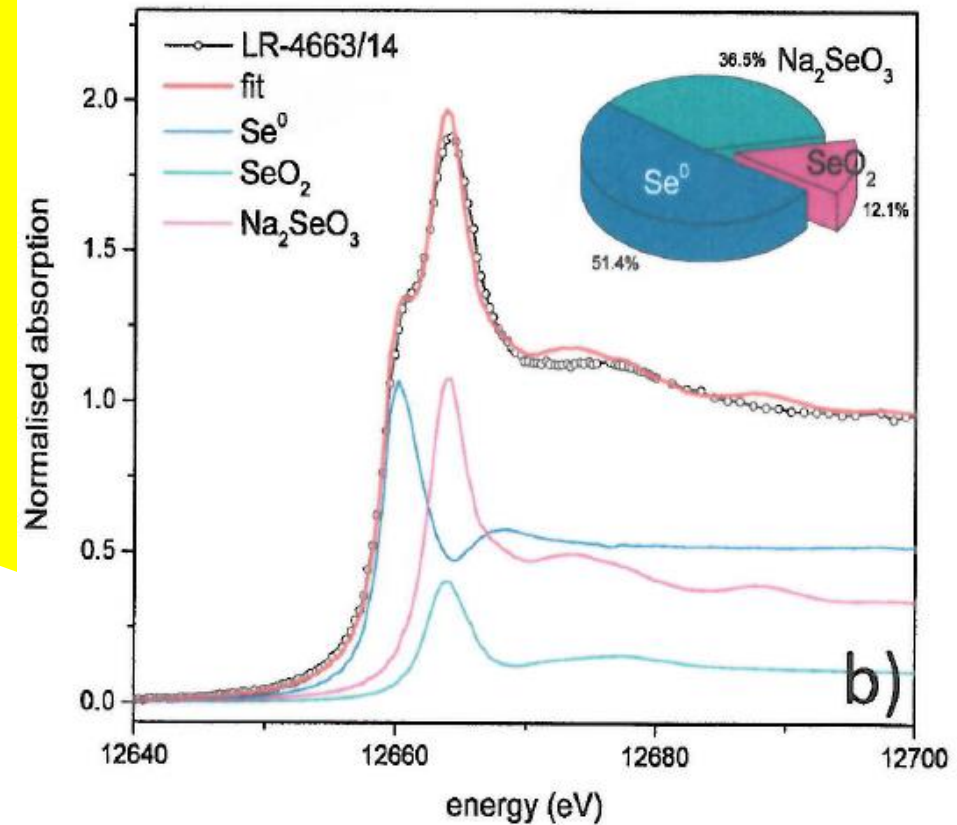
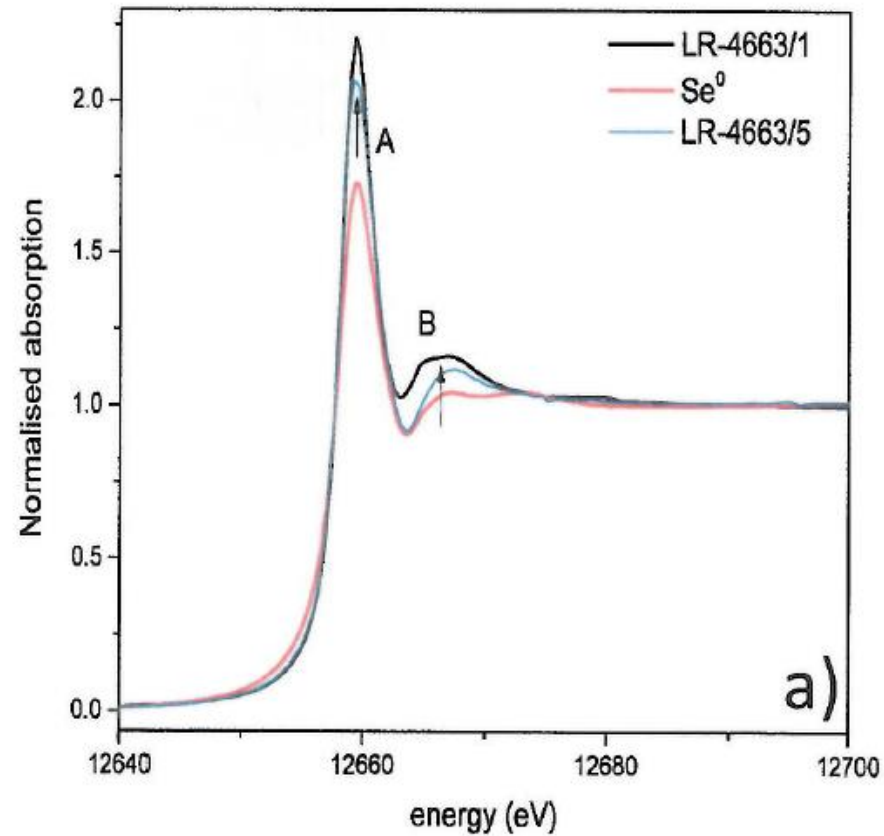


Fig4. (a) Linear combination fit of LR-4663/5 (suspension) and (b) Linear combination fit of LR-4663/14 (plastic).

Se oxidation state

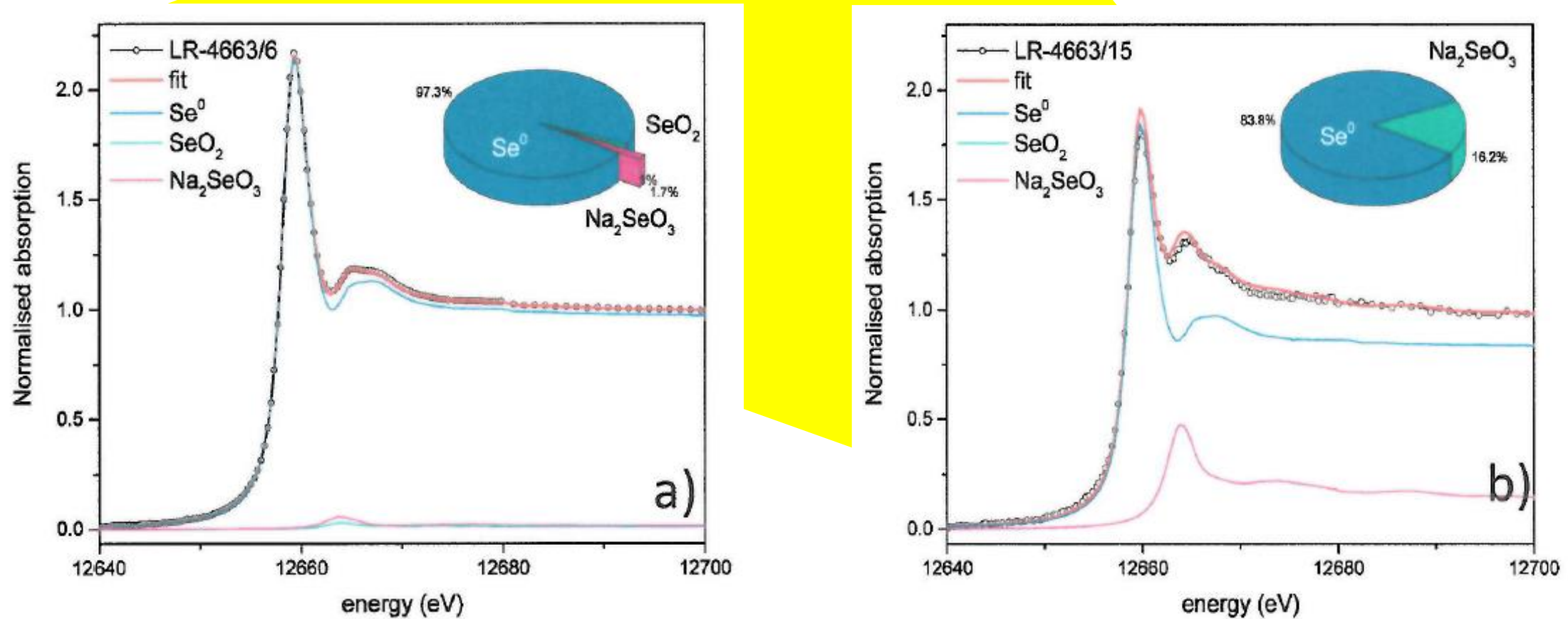


Fig5. Linear combination fit of LR-4663/6 and LR-4663/15 (plastic)

A large yellow arrow pointing to the right, with a red horizontal line passing through its center.

Thank you !