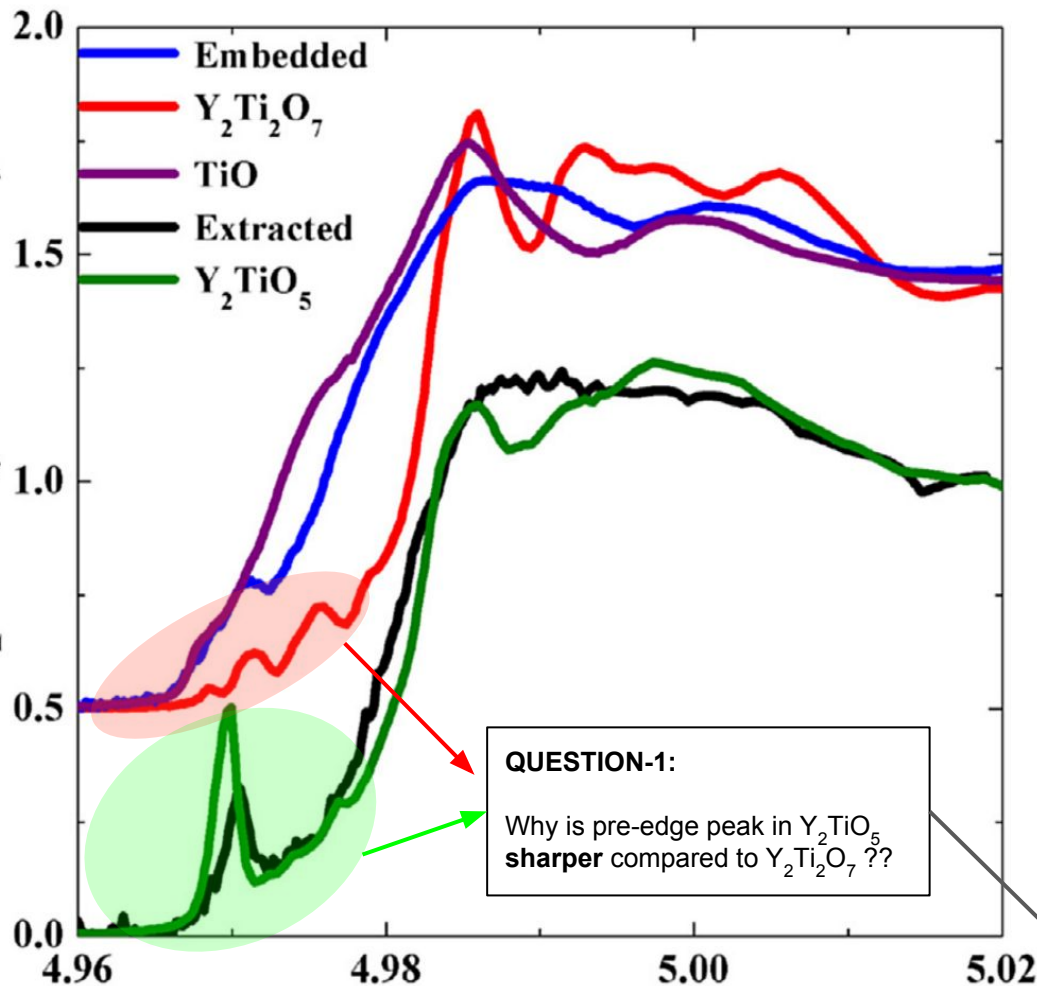


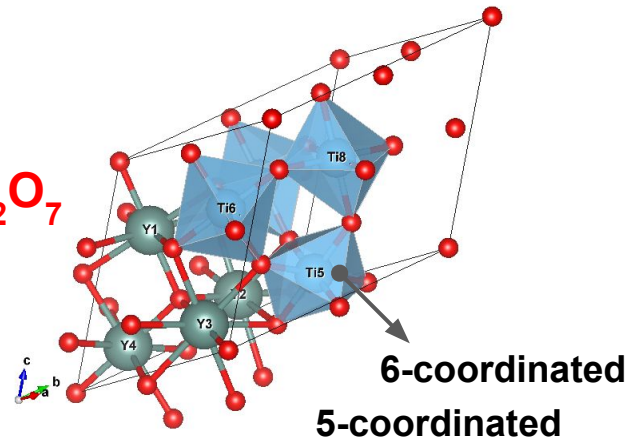
**QUESTION-1:**

Why is pre-edge peak in  $\text{Y}_2\text{TiO}_5$   
**sharper** compared to  $\text{Y}_2\text{Ti}_2\text{O}_7$  ??

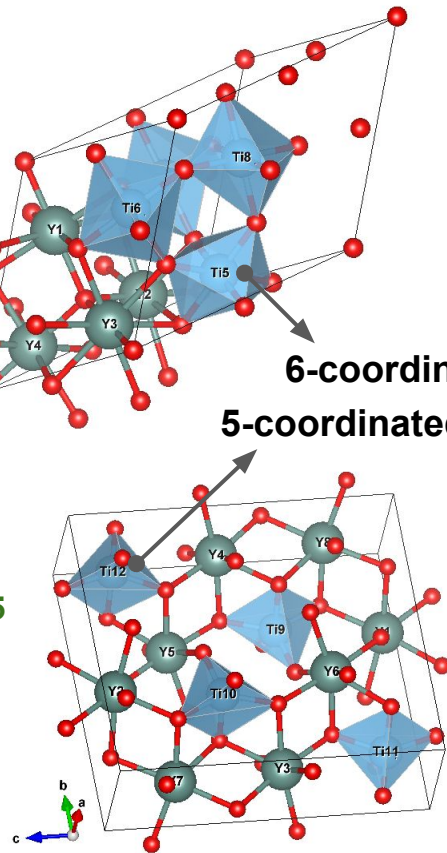
Absorption (arb. units)



$\text{Y}_2\text{Ti}_2\text{O}_7$

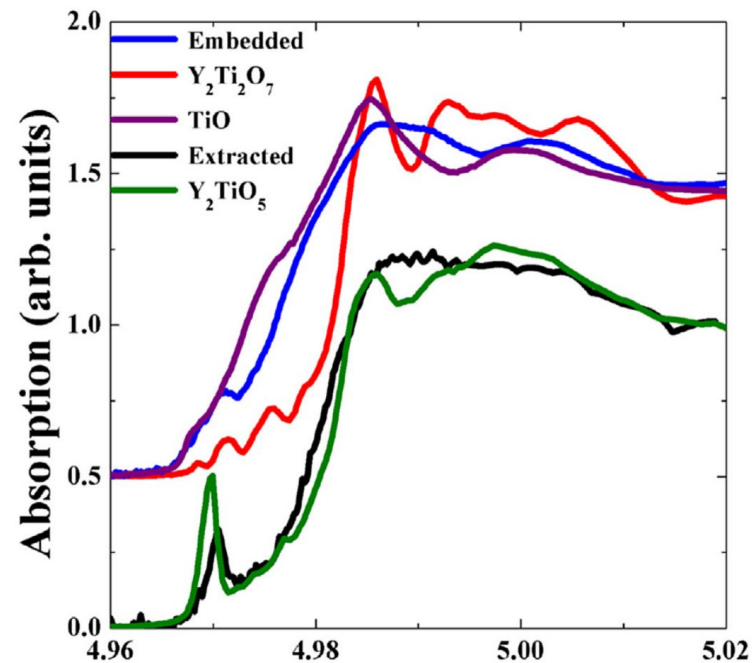


$\text{Y}_2\text{TiO}_5$



**ANSWER:**

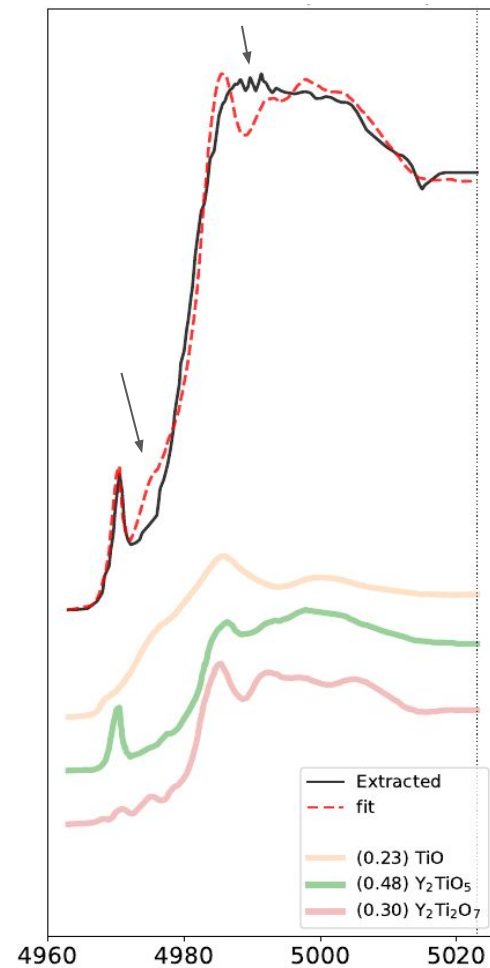
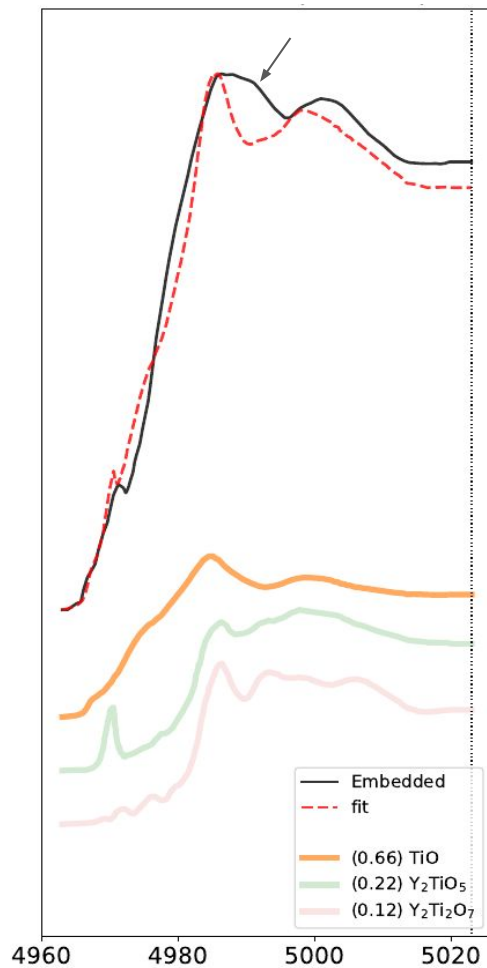
Because, all Ti ions of  $\text{Y}_2\text{TiO}_5$  are 5-coordinated. On the other hand, Ti ions of  $\text{Y}_2\text{Ti}_2\text{O}_7$  are 6-coordinated in octahedral environment. Broken inversion symmetry in 5-coordinated environment give rise to sharp pre-edge peaks.

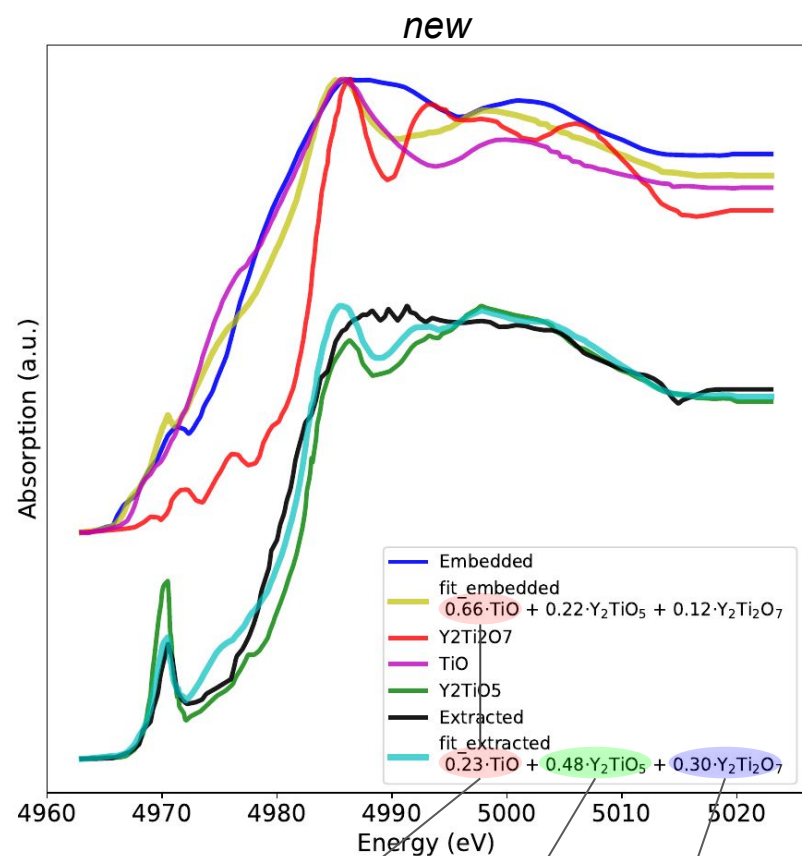
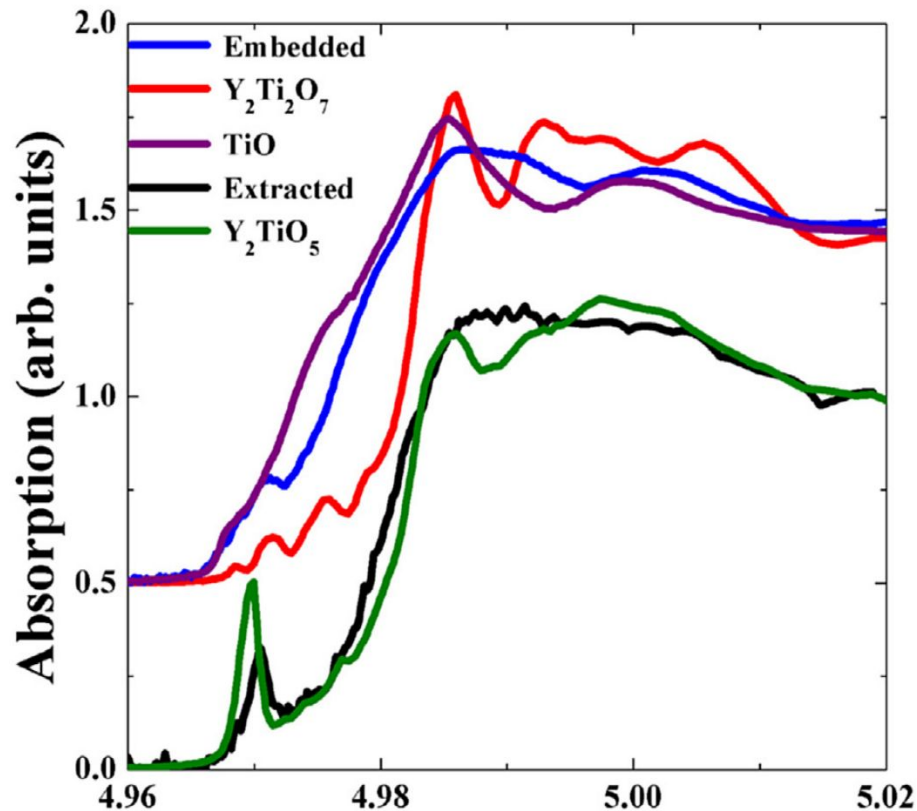


### QUESTION-2:

Can we represent Embedded and Extracted spectra as a linear combination of TiO,  $\text{Y}_2\text{Ti}_2\text{O}_7$ , and  $\text{Y}_2\text{TiO}_5$  spectra ?

**ANSWER: Yes !!**





**Conclusion-1:** The decrease from 0.66 to 0.23 suggest that TiO nanoparticles are filtered.

**Conclusion-2:** 0.48 suggest that  $\text{Y}_2\text{TiO}_5$  contribution is dominant in extracted spectrum.

**Conclusion-3:** Non-zero component from  $\text{Y}_7\text{Ti}_2\text{O}_7$  suggests that  $\text{Y}_2\text{TiO}_5$  co-exists with  $\text{Y}_7\text{Ti}_2\text{O}_7$