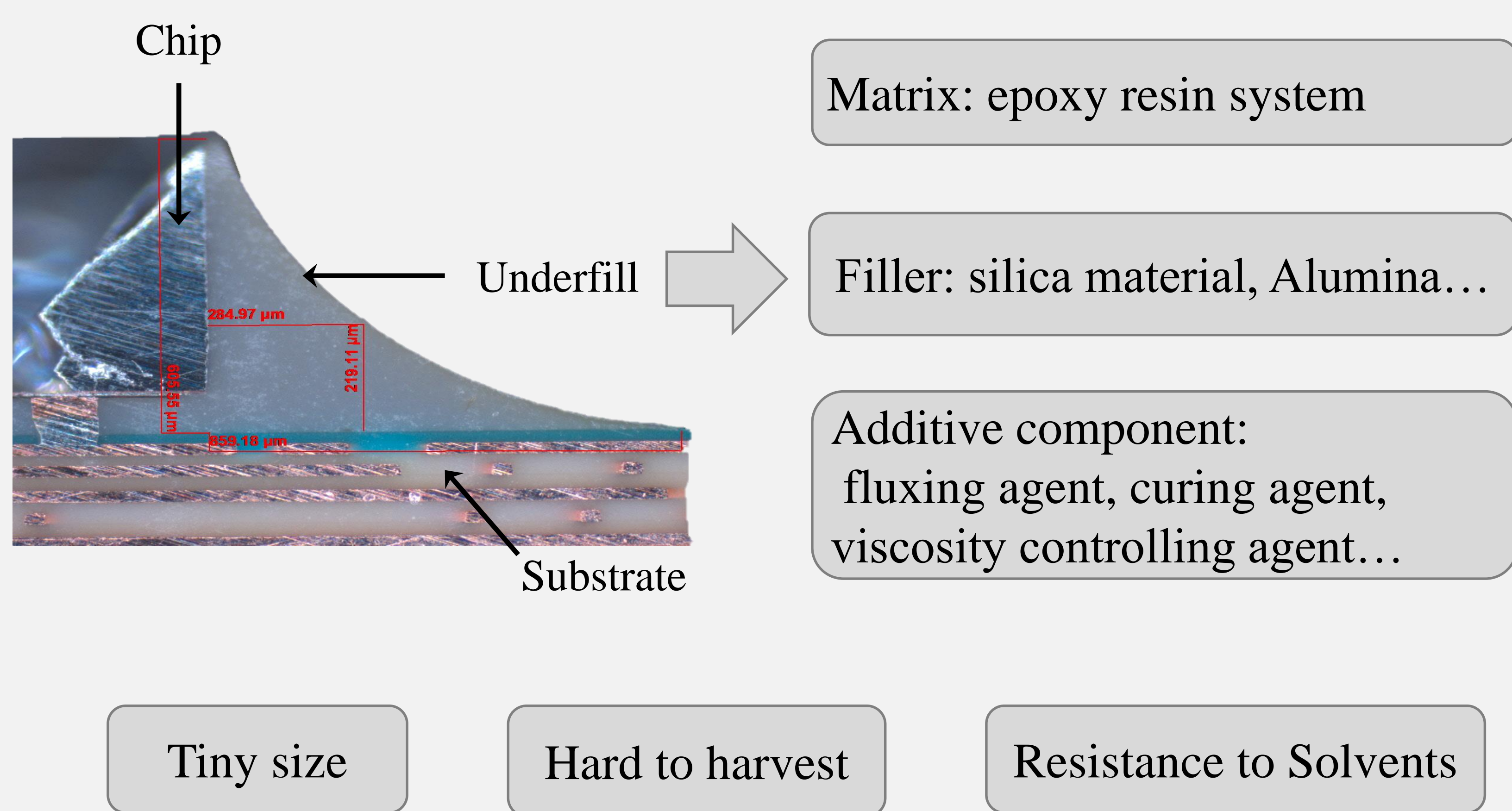




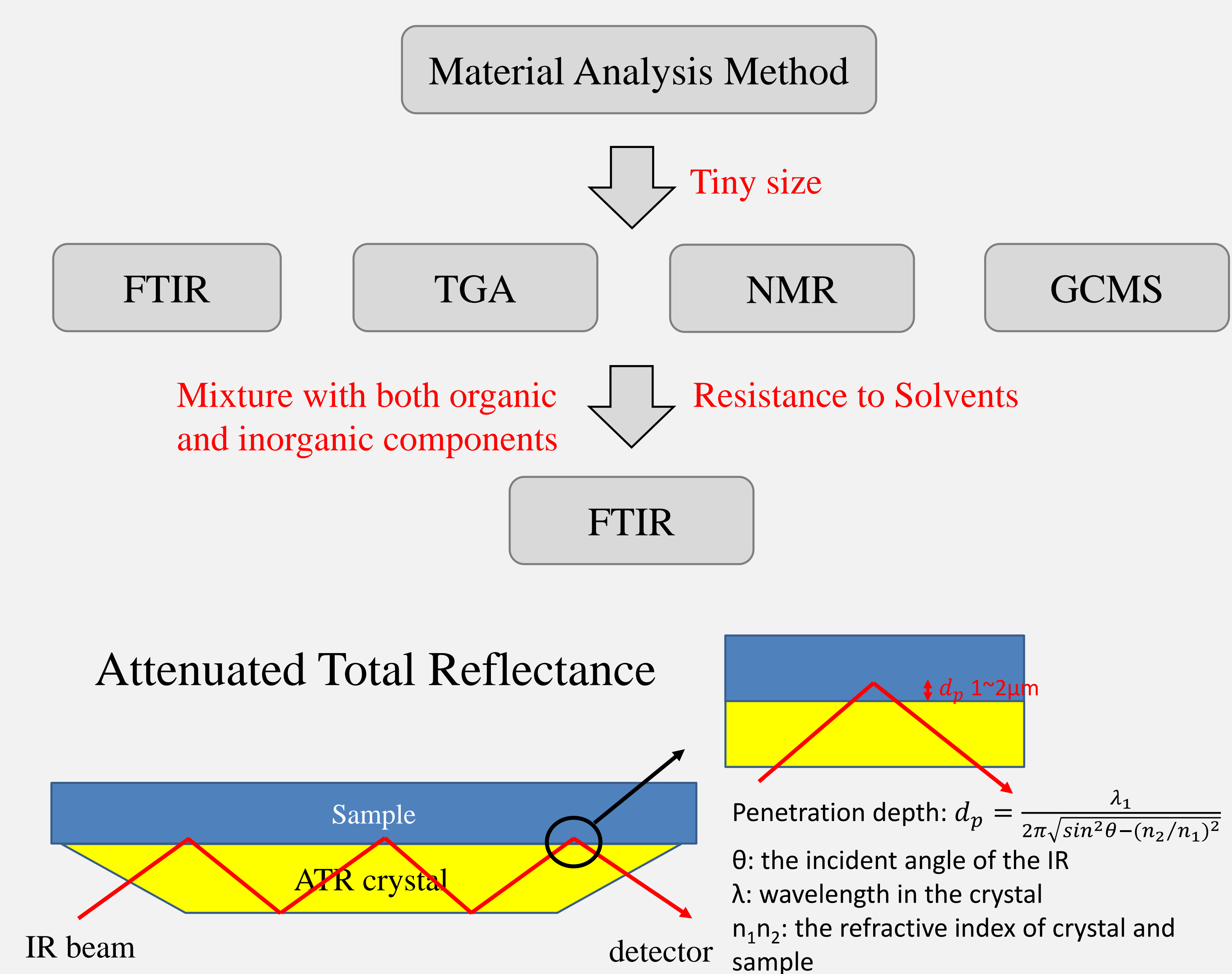
Background



Objectives

- Find the detection method and prove the effectiveness of this method for underfill materials identification.
- Present the guide line to collect the spectra of heterogeneous cured underfill materials from assembled packaging.

Test Method

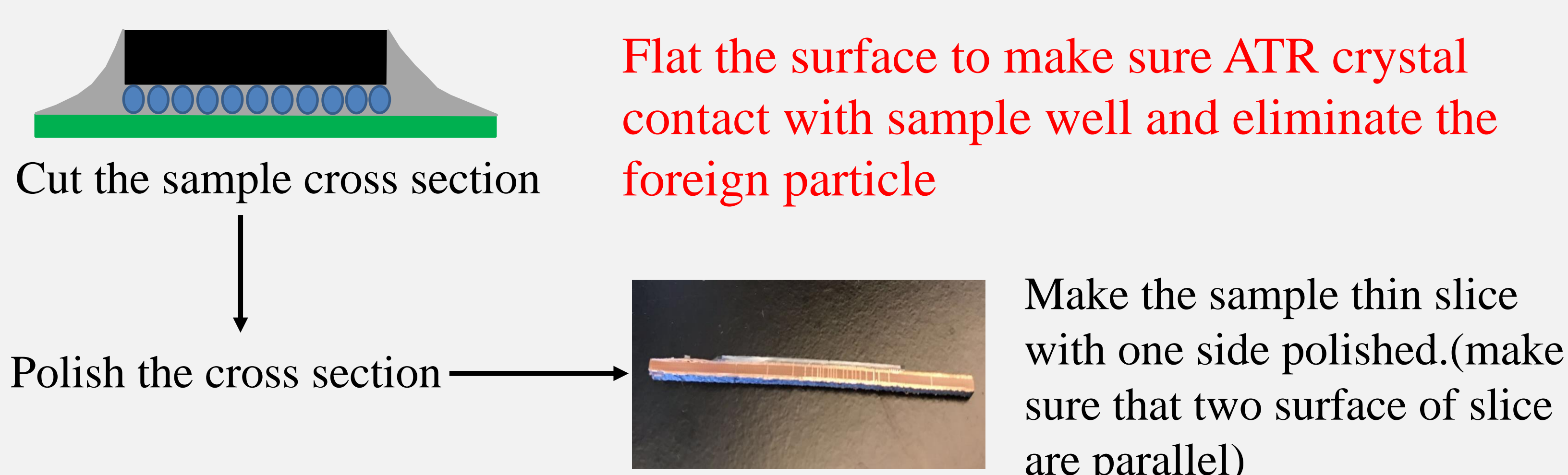


Sample Preparation

- Known underfill materials(UF1230, EP1641, SMT88U, SMC-375TGSF5):

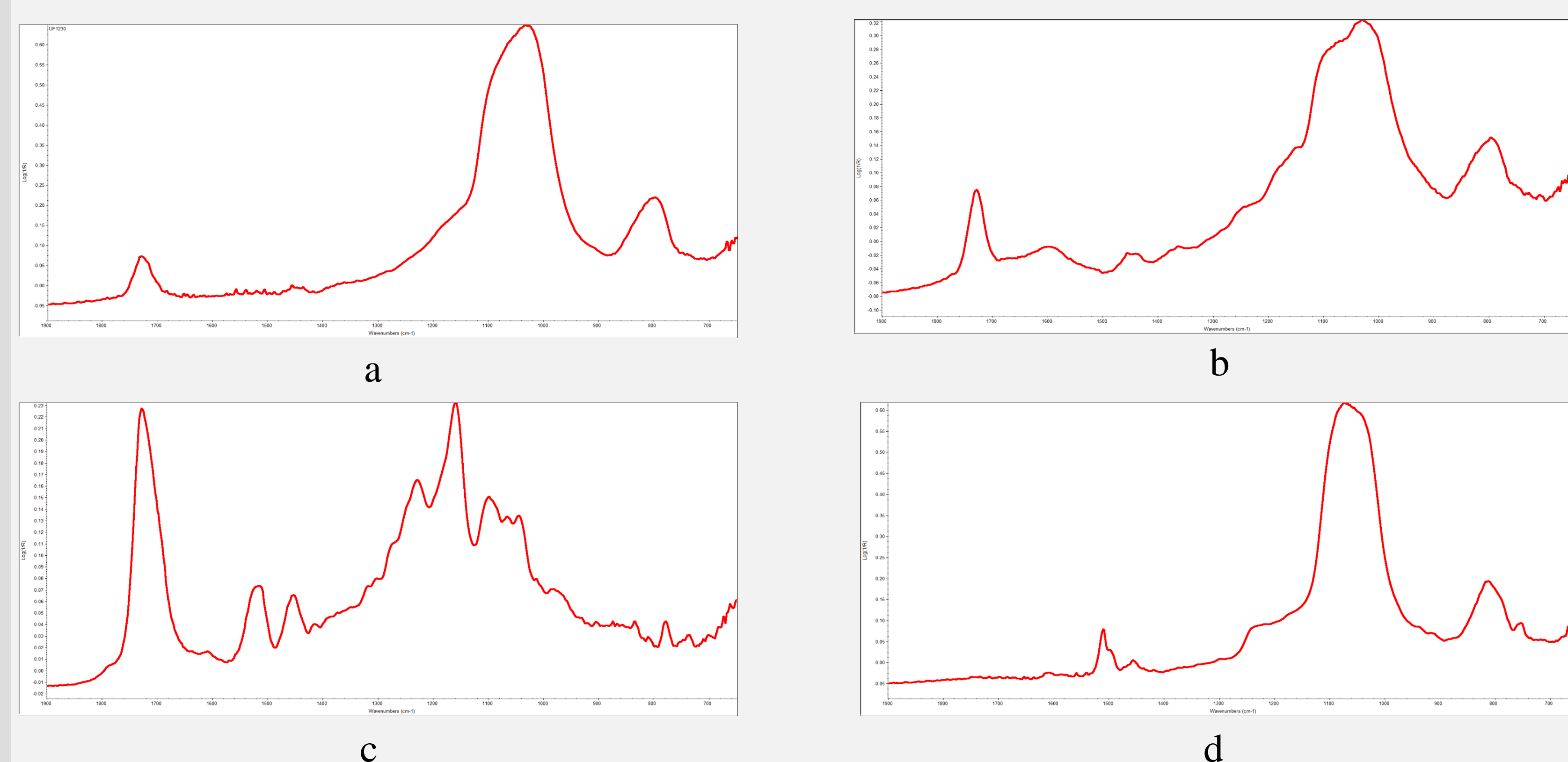
Follow the material sheet to make cured underfill samples

- Cured unknown underfill from assembled package:



Result and Discussion

1. Effectiveness of FTIR-ATR

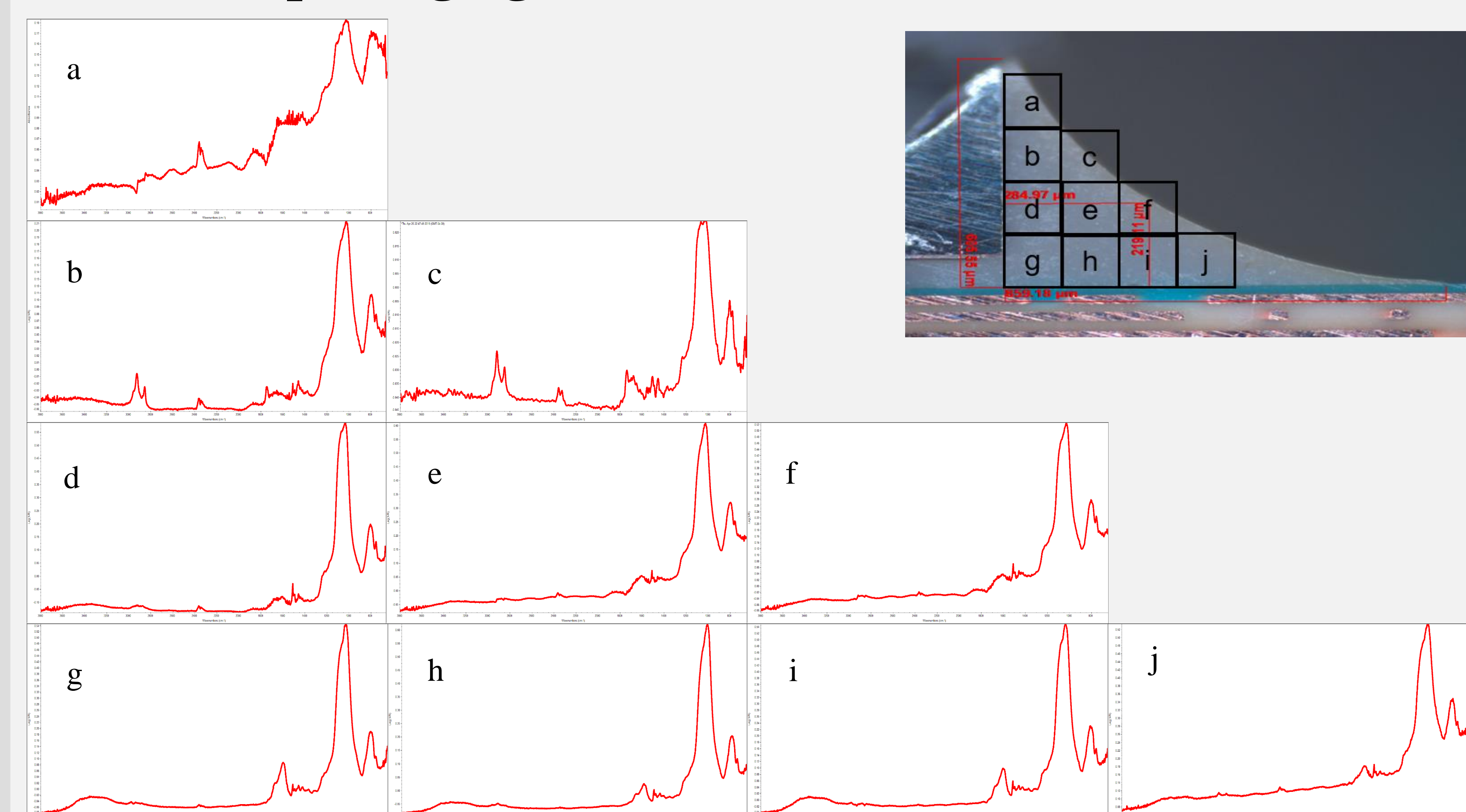


These are FTIR results of UF1230(a), EP1641(b), SMT88U(c), SMC-375TGSF5(d) four different kinds of underfill materials which UF1230 and EP1641 have similar components and similar color.

We compare the fingerprint region of these spectra. From this region, we can identify these four underfill materials effectively and efficiently.

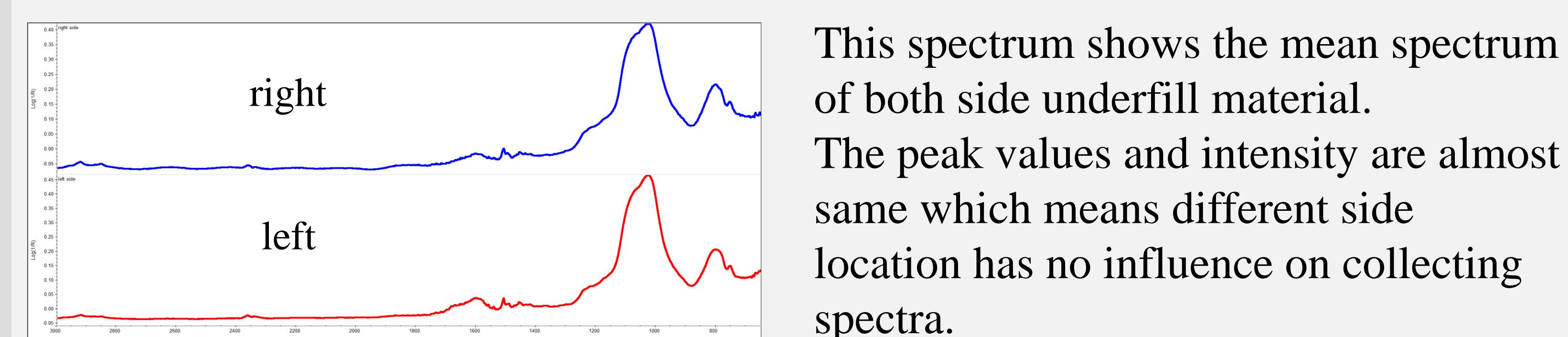
Fingerprint region (from about 1500 to 500 cm⁻¹) which is due to all manner of stretching & bending vibrations within the molecule is the unique characterization for each component.

2. FTIR on cured underfill materials from assembled packaging



Use 150 μm × 150 μm working area to detect 10 different areas of sample and list as its locations.

From the spectra, we can find that different positions in the horizontal direction have similar spectra but it shows differences in vertical direction.



This spectrum shows the mean spectrum of both side underfill material.

The peak values and intensity are almost same which means different side location has no influence on collecting spectra.

Conclusion

- FTIR is effective for cured underfill materials identification.
- Component distribution of underfill in vertical direction is the main factor that influence collecting heterogeneous underfill from Assembled package. Therefore, increasing the working area and collecting samples spectra from each different height is the best way to get completely samples spectra.