

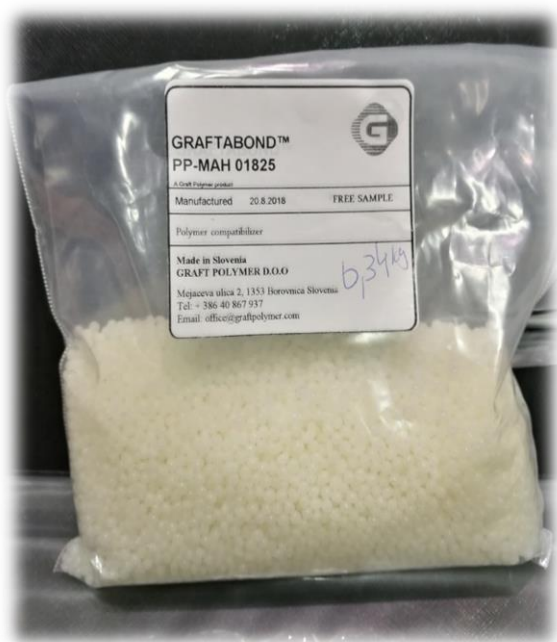


STABILITY OF GRAFTED MALEIC ANHYDRIDE IN PP-g-MAH

INTRODUCTION

Stability of grafted maleic anhydride was tested on grafted PP. We compared:

- GRAFTABOND PPH-MAH 01825, produced on 20.8.2018, stored in LDPE bag
- Scona 10213 GB, produced in August 2017, stored in HDPE container.

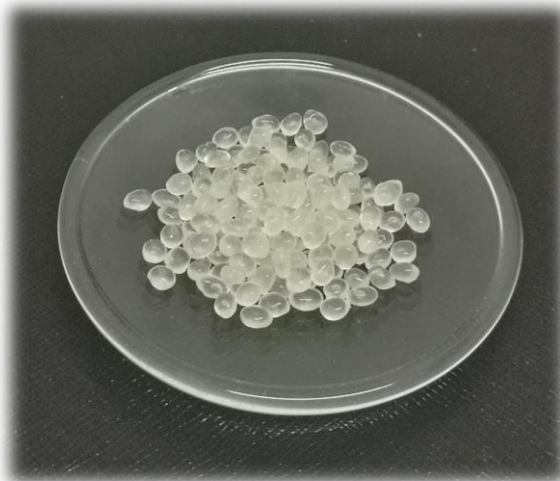


TESTS PERFORMED

We determined the amount of maleic anhydride and maleic acid in GRAFTABOND™ PPH-MAH 01825, and Scona TSPP 10213 GB by using ATR-FTIR spectrometer.

PP-g-MAH was analyzed under the following conditions:

- After being unpacked on 22.11.2018,



- After 1 hour of immersion in water, heated to 50°C,

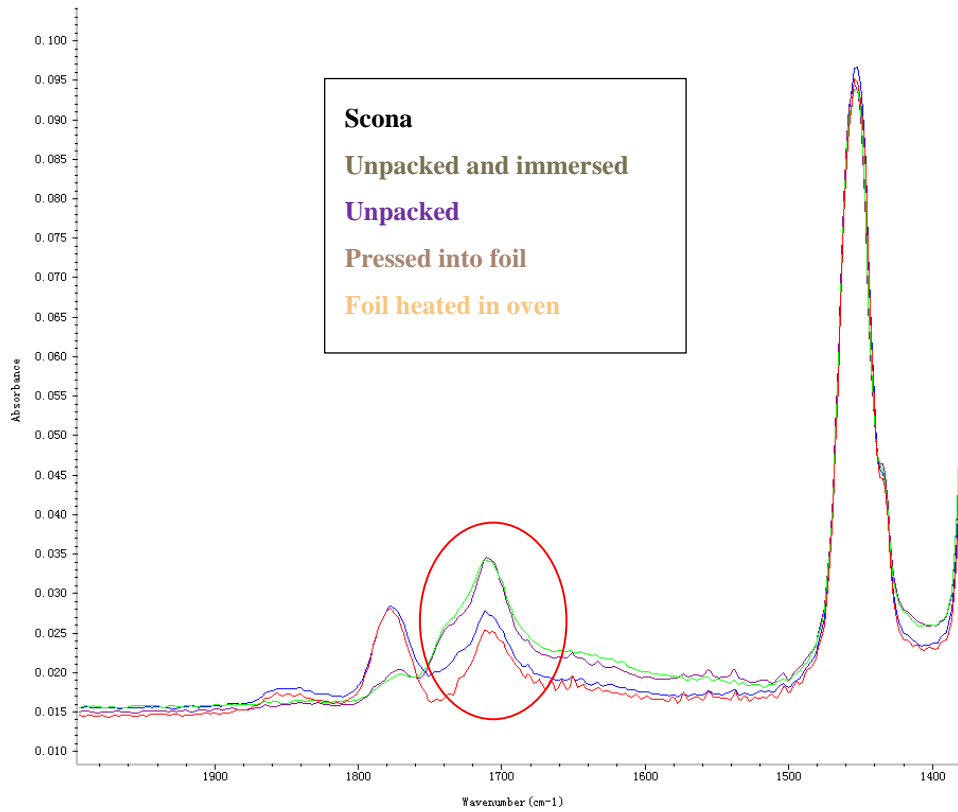
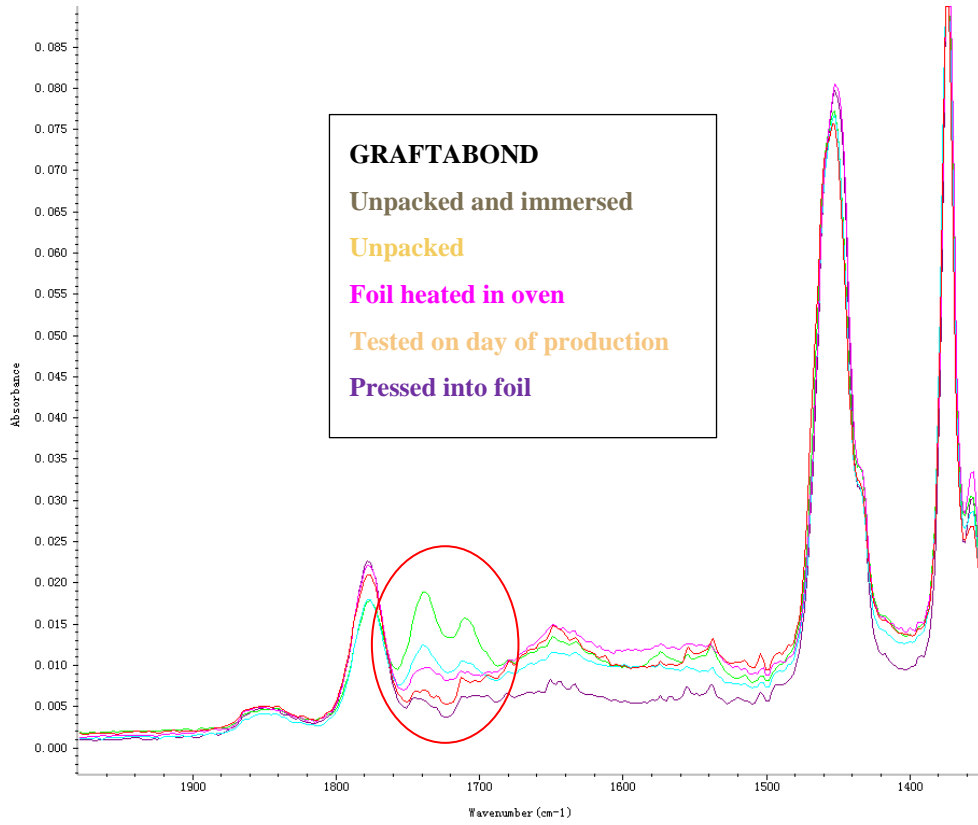


- After pressing the materials at 200°C for 10 seconds into a foil,



- After keeping the foils in an oven at 80°C for 3 hours.





Acid is shown on the spectra by the red circles. More acid means lower peaks, on the left from the circle – Anhydride peaks.

We calculated % of MAH, by using the area of peaks at 1850 cm^{-1} and 1780 cm^{-1} .

Sample State	MAH Content [%]	
	<i>GRAFTABOND</i>	<i>SCONA</i>
TDS Value	2	1,8
Unpacked from warehouse	1,64	0,25
Pressed into foil	2,00	1,16
Foil heated in oven for 3 hrs	1,83	1,35
Unpacked and immersed in water	1,38	0,11

CONCLUSION

- Conversion of maleic anhydride to maleic acid reduces its effectiveness by around 5 times.
- When time passes, anhydride naturally transforms into acid
- By subjecting PP-g-MAH to processing parameters, acid turns back into anhydride.
- GRAFTABOND converted into 100% anhydride in 10 seconds at 200°C , Scona still had a lot of acid leftover
- When heating the material for a longer time, the graft remains stable – only slight conversion into acid, until reaching equilibrium