



GRAFTING OF MALEIC ANHYDRIDE TO POLYOLEFIN SCRAP

In this report, we grafted maleic anhydride to four different kinds of scrap material, to functionalize it.

MATERIALS USED

Scrap materials used were:

- LDPE based scrap P218
- LDPE based scrap P218 White
- PP based scrap P219
- Mixed scrap PP/PE

TESTS PERFORMED

All materials were prepared on a laboratory scale extruder.

We tested the grafted materials:

- melt flow index (MFI)
- volatile organic compound content (VOC)
- grafting degree



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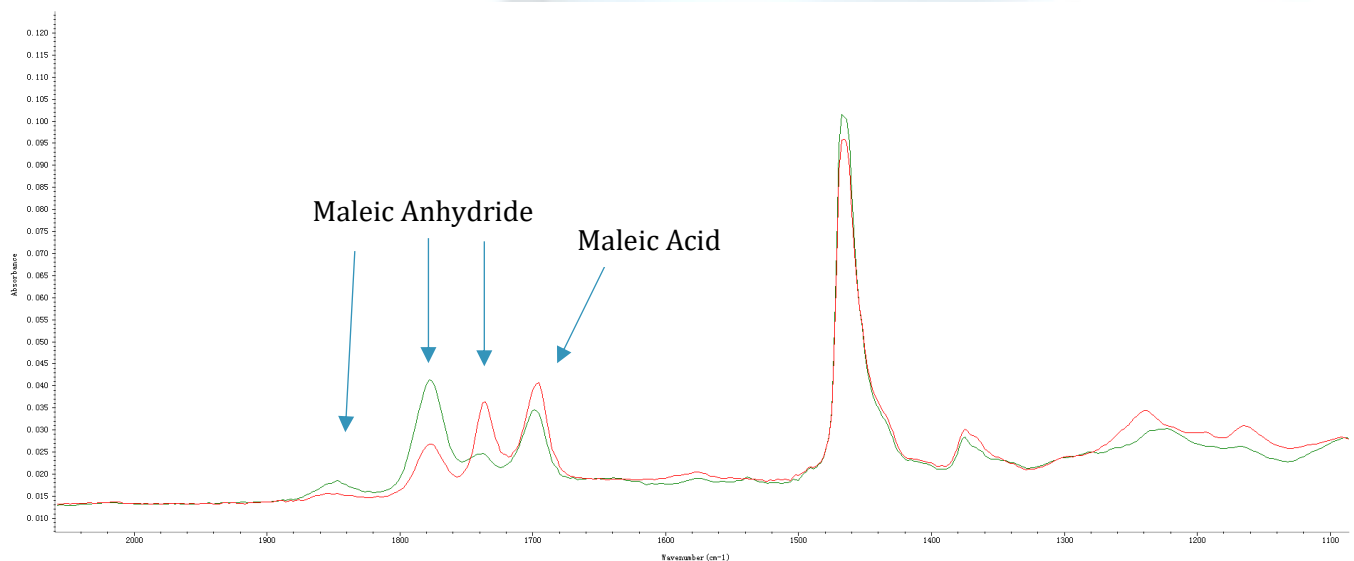
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Material Report

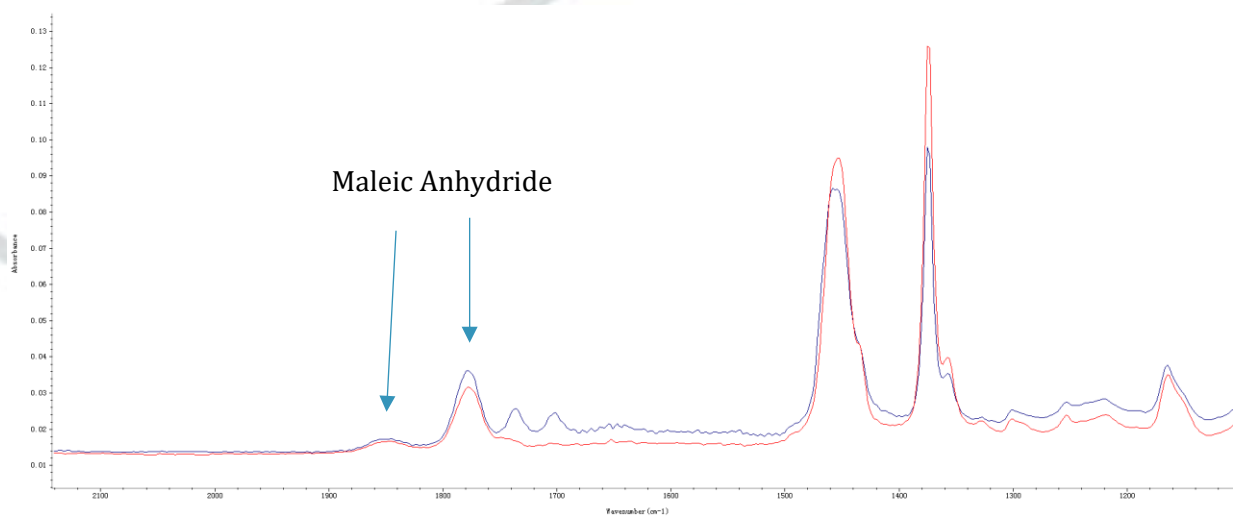
RESULTS

Material	MFI [g/10 min]	VOC [%]	Grafting Degree [%]
P218 LDPE	1,0	0,50	3,0
P218 LDPE White	2,6	0,10	2,2
P219	5,6	0,45	2,5
Mixed Scrap	3,4	0,27	2,4

FTIR spectra was used to determine grafting degree of all materials. Maleic anhydride is seen on the following wavelengths: 1850 cm^{-1} , 1780 cm^{-1} , 1720 cm^{-1} . The peak at 1707 cm^{-1} is signaling the acid that forms when maleic anhydride comes into contact with water.



Above picture shows the P218 white material grafted scrap (red spectra) and the green one shows P218 grafted scrap.



Above picture shows the mixed scrap PP/PE (red spectra) and the blue one shows P219 grafted PP scrap.

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CONCLUSIONS

- We successfully grafted high amounts (> 2%) of maleic anhydride to all scrap types
- When grafting to PE type polymers, MFI usually decreases
- When grafting to PP type polymers, MFI usually increases
- This modification makes scrap materials good compatibilizers for other scrap based materials and mixtures of similar composition

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