

Rapid Testing for Slip Agents in Plastic Consumable Packaging Using Atmospheric Solids Analysis Probe Coupled with Compact Mass Spectrometer (ASAP®-CMS)

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NEW! Clamshell packaging from Analytical Sales & Services, Inc.

Overview

A variety of additives are employed to make plastics processable and to assure their end-use properties. These additives include supplements such as slip agents (amides), plasticizers (phthalates) and some heavy metals.

Zip bags are made from polypropylene and polyethylene and all use slip agents including Oleamide m/z 282, Erucamide m/z 338, and Stearamide m/s 284 as part of the manufacturing process. These slip agents are the most common contaminants that interfere with LC/MS work due to their ability to transfer, by physical contact, to the product it's meant to protect or keep clean. This is the case as indicated by ASAP-CMS analysis conducted on various suppliers' packaging of common laboratory consumables including: caps and septa, high throughput plates, HPLC fittings, just to name a few.

To circumvent the transfer of slip agents, a substitution for the common zip bag is necessary. Clamshell packaging has been around for a very long time, and while a bit more costly, clamshells have the properties to restrict cross contamination. MS probe experiments were conducted to illustrate five differing suppliers' packaging, followed by the new clamshell packaging for 96 well products.

Methods

Atmospheric Solids Analysis Probe coupled with Advion Compact Mass Spec (ASAP-CMS). See Figure 1.

By inserting a melting point glass tube into a stream of hot nitrogen gas, the solid is thermally desorbed (evaporated) from the tube's surface and then ionized at atmospheric pressure by the corona discharge of an APCI source.

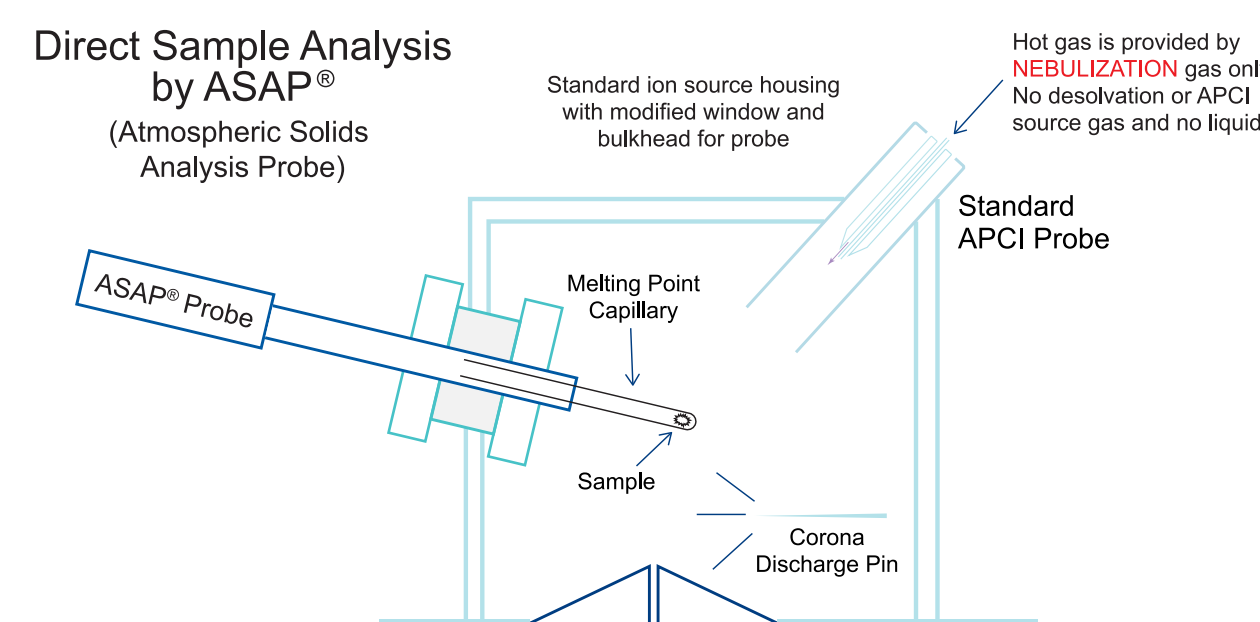


Figure 1 Atmospheric Solids Analysis Probe

Introduction

Workflow for measurement of packaging products using ASAP-CMS. Glass capillary probe is drawn across sample surface to transfer to probe, followed by insertion into CMS (figures 2 and 3).



Figure 2 Sample Probe

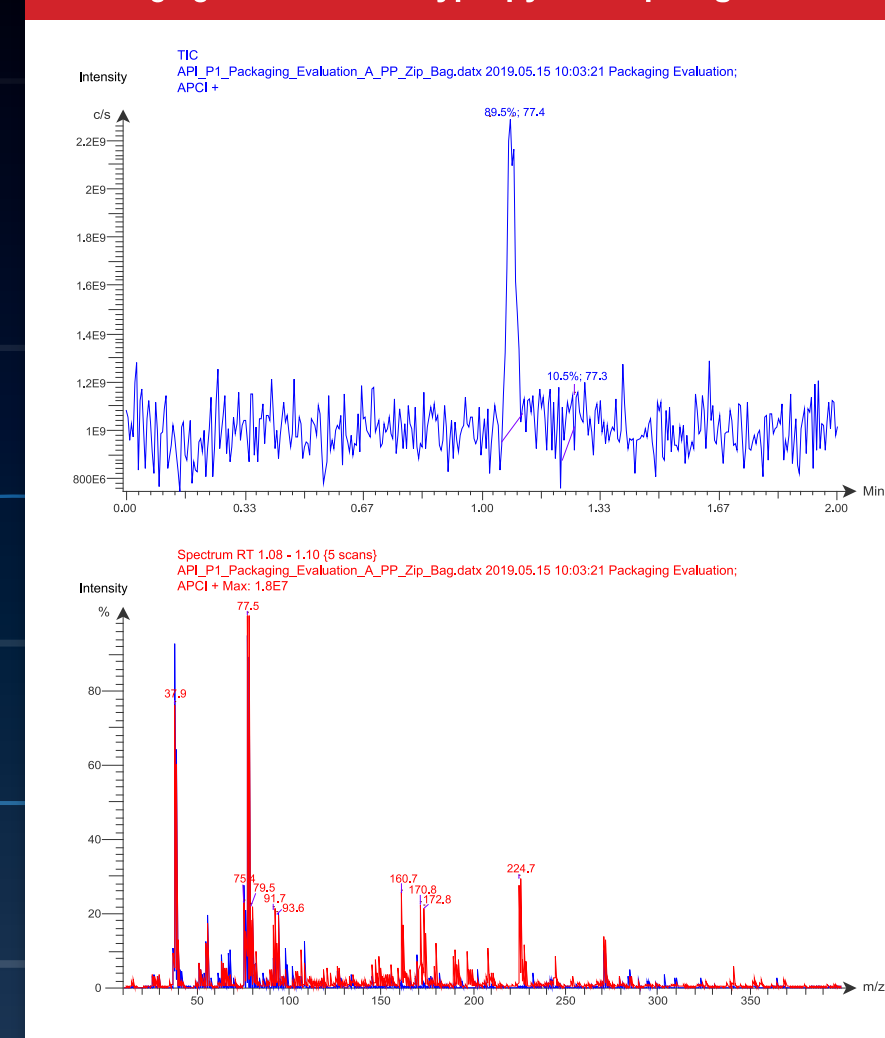


Figure 3 CMS Port

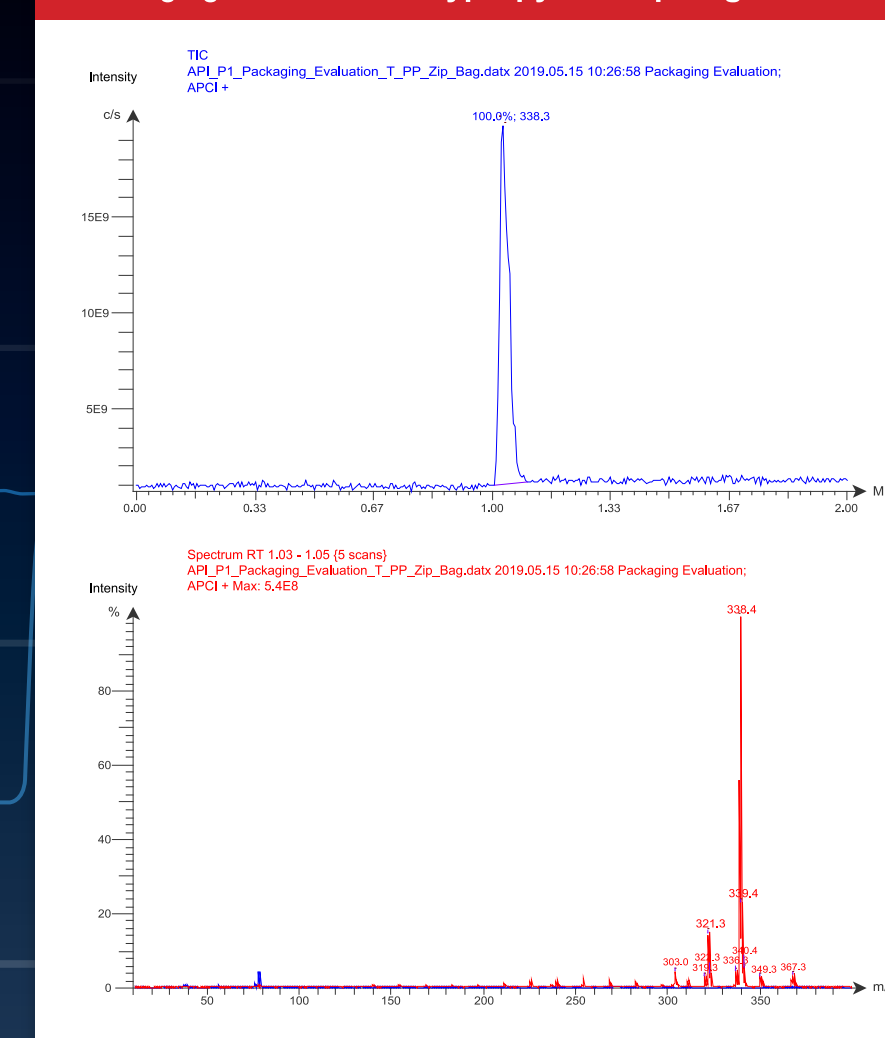
Acknowledgements

Figure 1 Courtesy of Advion Inc., Ithaca, NY
ASAP-CMS is a registered trademark of Advion Inc.

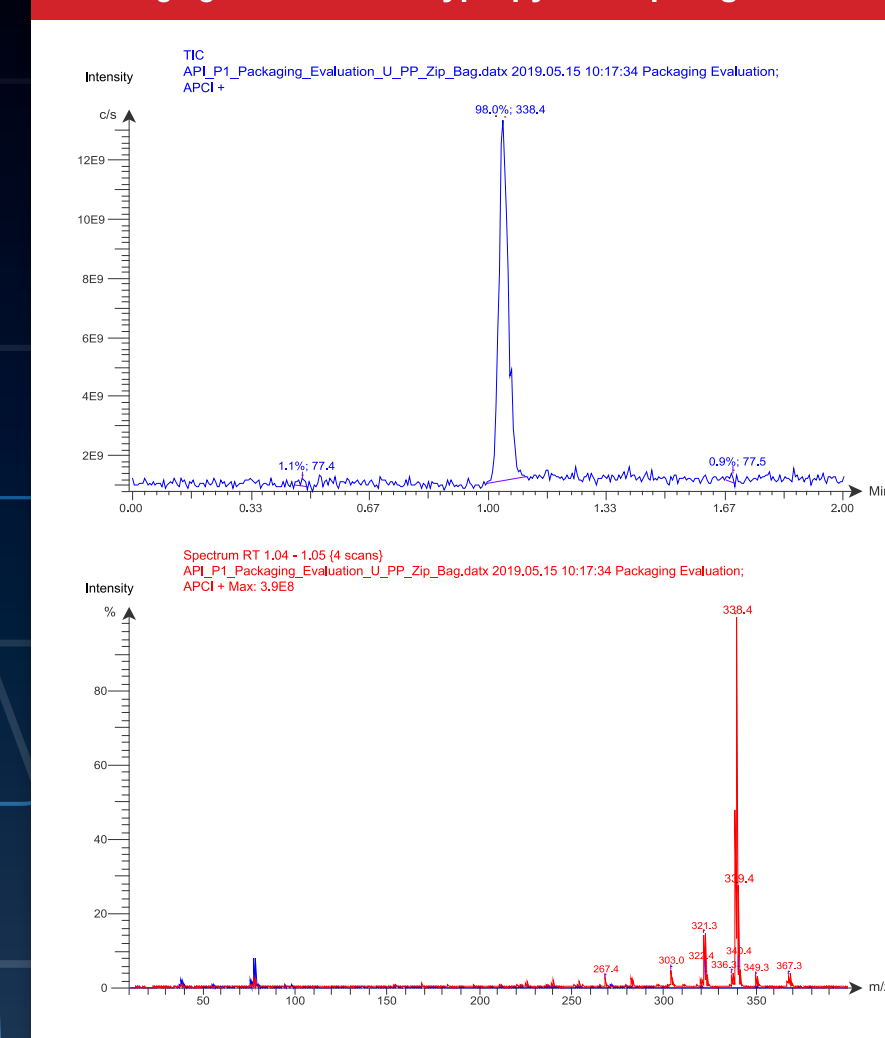
Packaging Evaluation: Polypropylene Zip Bag "A"



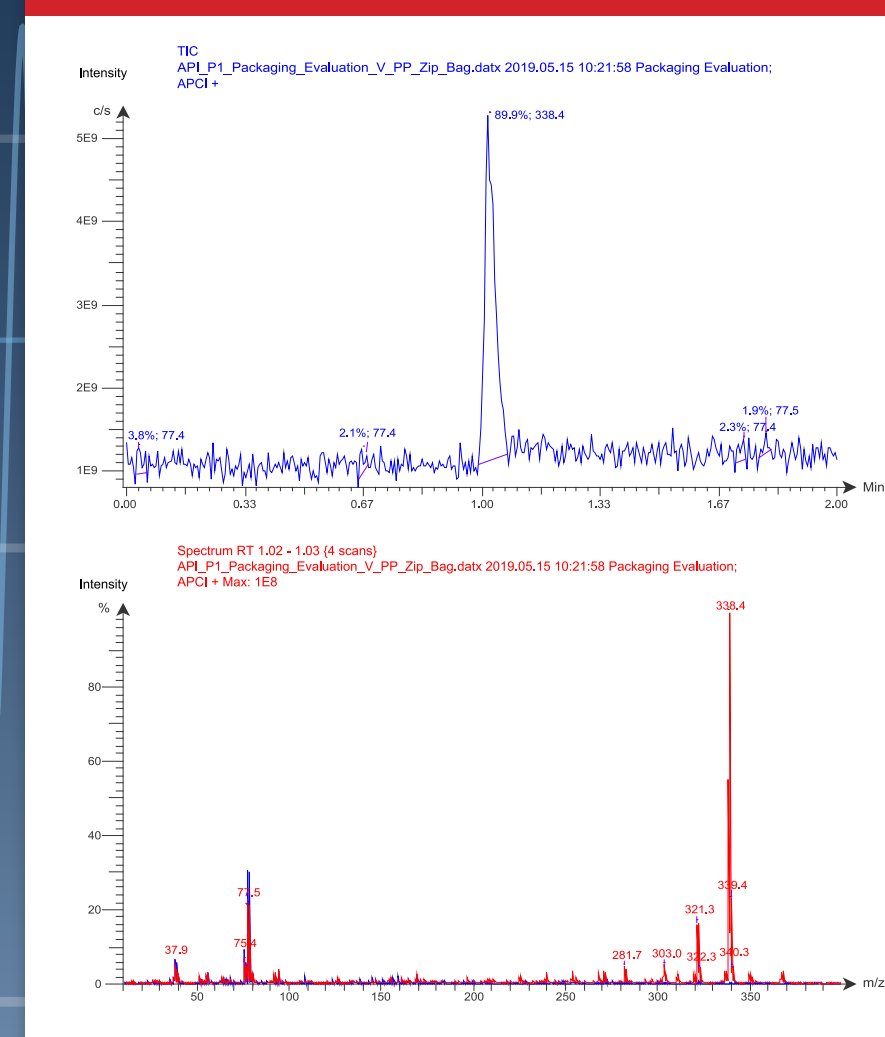
Packaging Evaluation: Polypropylene Zip Bag "T"



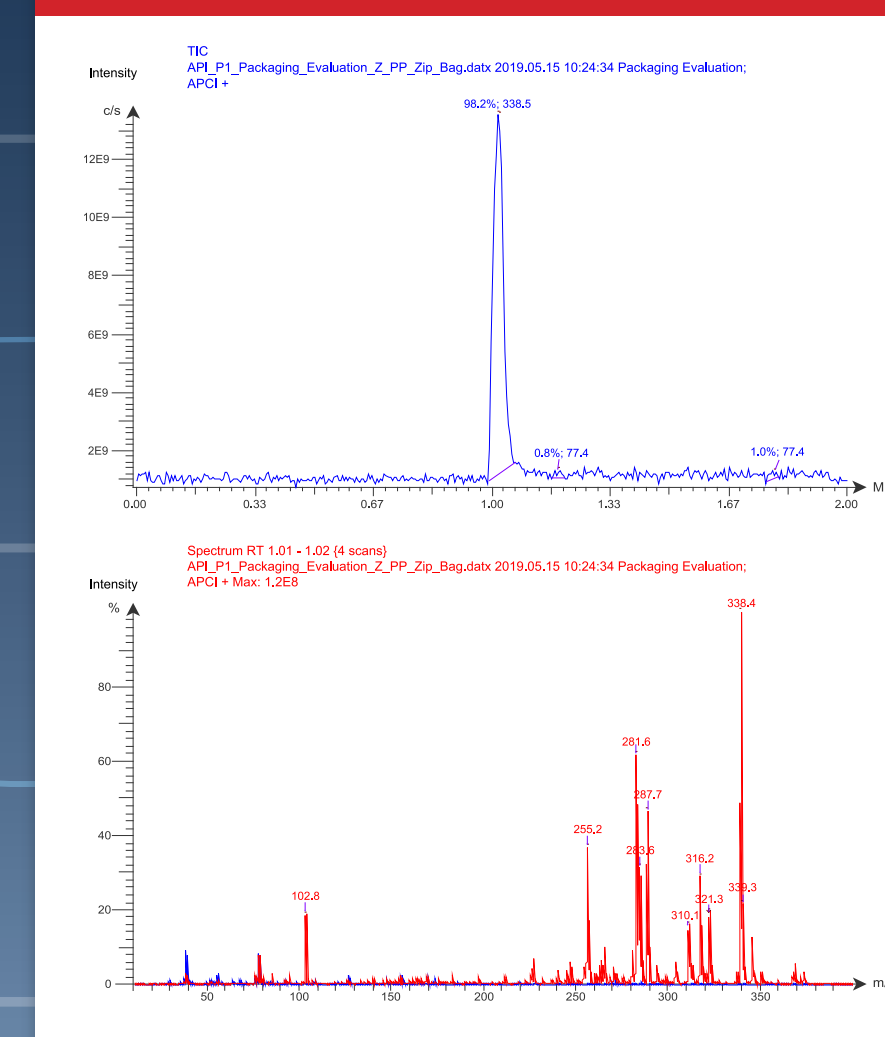
Packaging Evaluation: Polypropylene Zip Bag "U"



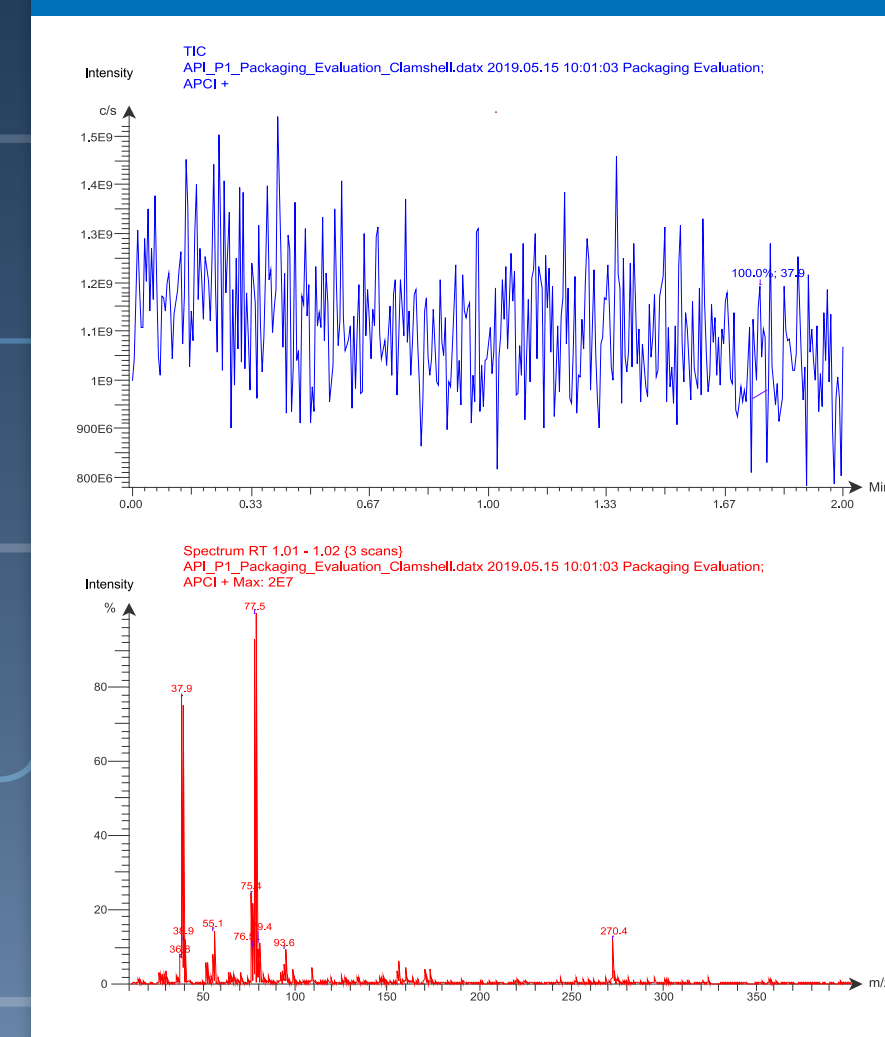
Packaging Evaluation: Polypropylene Zip Bag "V"



Packaging Evaluation: Polypropylene Zip Bag "Z"



Packaging Evaluation: Clamshell



Summary

Clamshell packaging has minimal crosstalk and contact contamination as compared to customary zip bag or polypropylene and polyethylene materials.

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