

## International Crystal Laboratories

*The Source...*

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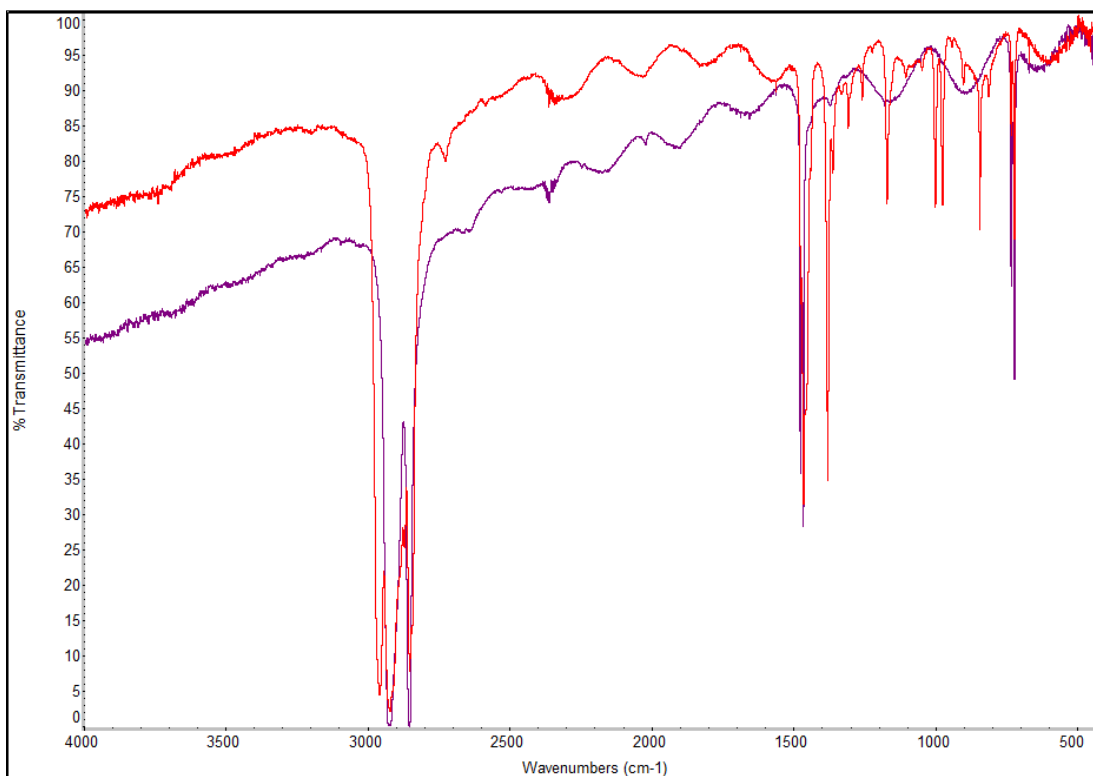


February 20th, 2024

### Important Quality Memo Regarding ICL Disposable Sample Cards Polyethylene vs Polypropylene in the Infrared

International Crystal Laboratories has for decades been supplying a variety of disposable sample cards for Infrared Spectrometer sampling of mixtures, pastes, smears and other types of samples. The ICL or "3M" disposable card for FTIR has been a ubiquitous accessory used in thousands of tests around the world in IR and FTIR spectrometers.

Recently it's been impossible to acquire pure Polyethylene material of the appropriate thickness and texture compared to the previous ICL Polyethylene cards, and this difference has caused some questions and concerns by ICL and its customers.

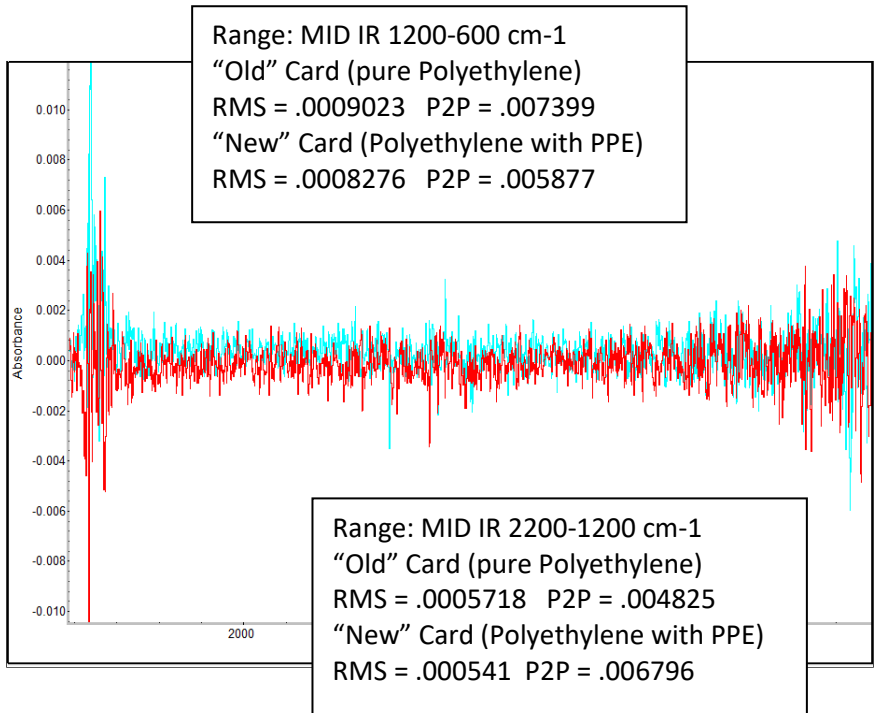


Above in Blue is the infrared spectrum of so called "Pure" Polyethylene substrate (approx. 16 microns thickness) alongside the newer material in Red which is Polyethylene plus Polypropylene, and which noticeably obscures the infrared spectrum with additional lines. Notice the prevalence of more mid-IR bands in the Red spectrum compared to the somewhat cleaner Blue spectrum derived from previous lots of Polyethylene IR cards.

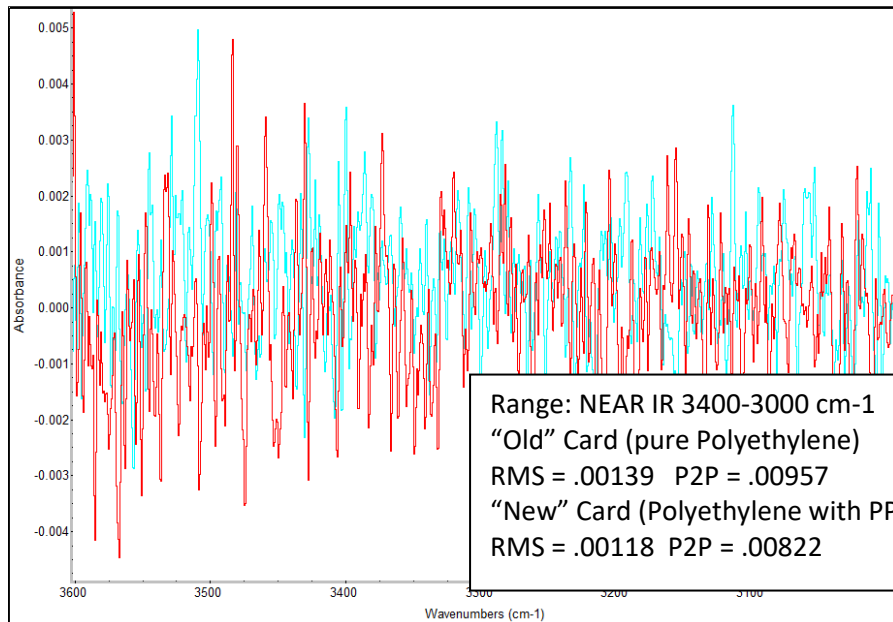
The effect of the additional lines in the Mid-IR is somewhat unknown in terms of practical use for your average customer samples. These facts should be considered by the scientist when selecting the appropriate disposable IR card substrate.

While its true when compared to the old card, the Polypropylene lines do proliferate in the mid-IR, the net effect of such lines in testing might be negligible to the end user.

When the (stable) interference features are ratioed out between the background and the sample, a relatively similar noise profile is seen between the two cards.



In the above example, the "old" card and the "new" cards are seen in the infrared, at 32 scans, 2cm-1 res., background vs. empty sample in absorbance. We measured the PeakToPeak noise and the RMS noise in the Near IR and Mid IR for comparison. We find only that while there is a small increase in Peak-to-Peak noise from the PPE in the new cards, the overall effect throughout the mid-IR range when measured as RMS noise is less remarkable.



In the example to the left, the noise is measured for comparison in absorbance in the Near-IR. It appears in the Near-IR that the newer card is preferable as more overall transmission is observed and the resultant noise level is correspondingly lower across the range.

In conclusion, each user should evaluate the effect of the additional PPE lines in the newer cards before deciding whether to purchase from the new lots. Users of the cards previously may only observe the differences in the single beam background data, while for others the presence of the PPE lines in the spectrum may have a more significant effect. Please do not hesitate to Contact the experts at ICL with your questions or your comments.