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LABORATORY REPORT

Advanced Materials Center, Inc.

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Client: Willow Ridge Plastics, Inc.
Ray Loflin

Date: **March 8, 2019**
Project: **19P1031**
PO#: **2019-399**

Purpose:

Expose two (2) types of film to UV exposure per ASTM D-5208 fluorescent ultraviolet (UV) exposure of photodegradable plastics. Tensile tests per ASTM D3826 will be performed to determine when the sample(s) reach 5% or less elongation.

Sample Identification

A: Polyethylene film (Control)
B: Polyethylene film modified with 3% loading of WRP additive (PDQ-M)

Supplier:

Willow Ridge Plastics, Inc.

Results & Observations:

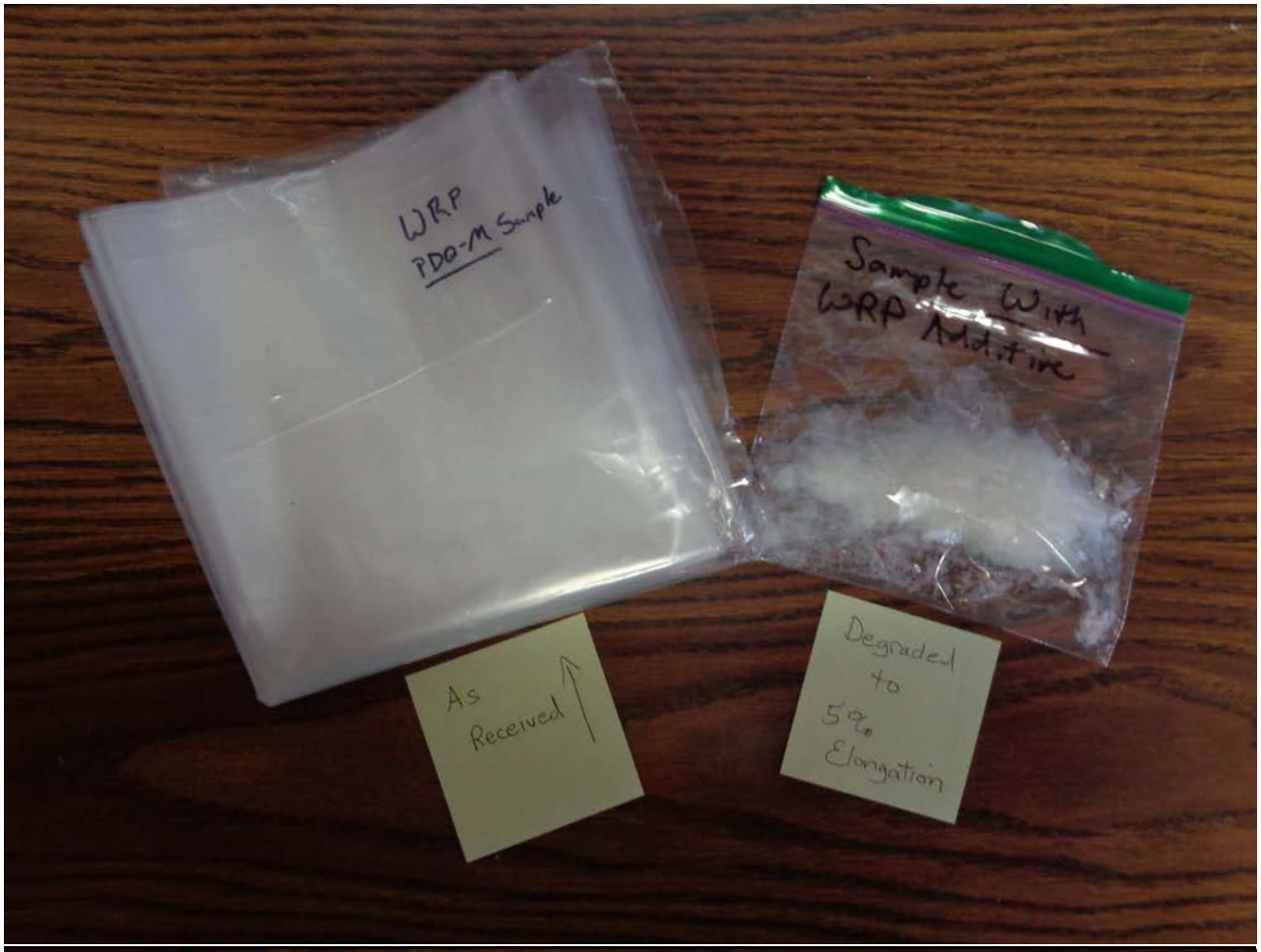
Testing confirms that the sample containing the WRP additive degraded to the point of 5% elongation at a faster rate than the Control sample that DID NOT contain the WRP additive.
The modified film reached 5% or less elongation after nine (9) days compared to the fifteen (15) days for the non-additive Control film.
The two (2) film types were different in both appearance & physical characteristics when reaching the respective 5% elongation values. The Control film maintained strength until it was bent, folded or pulled. The modified film became so delicate that it would fragment with the slightest touch.

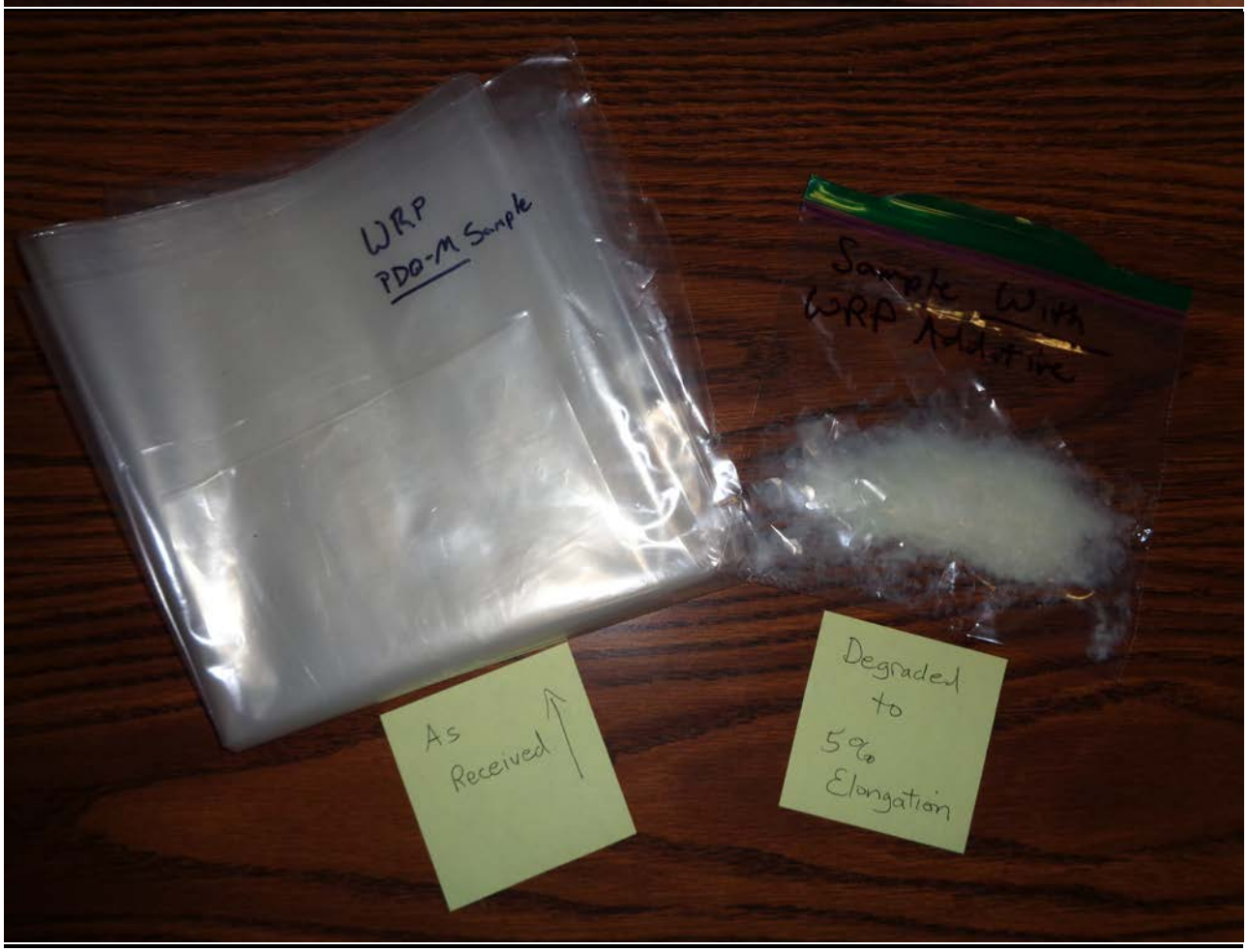
Conditions:

Exposure took place in a programmable QLab Corp. Chamber Model QUV/SE S/N: 08-15330-77-SE.
The tensile values of the film materials were determined by a Lloyd / Ametek universal tensile/compression unit (calibration date 5/7/18).

James Cameron

James Cameron
Laboratory Manager
Attached: Digital pictures


WRP
PDO-M Sample
Sample With
WRP Additive
As
Received
Degraded
to
5%
Elongation


WRP
PDO-M Sample
Sample With
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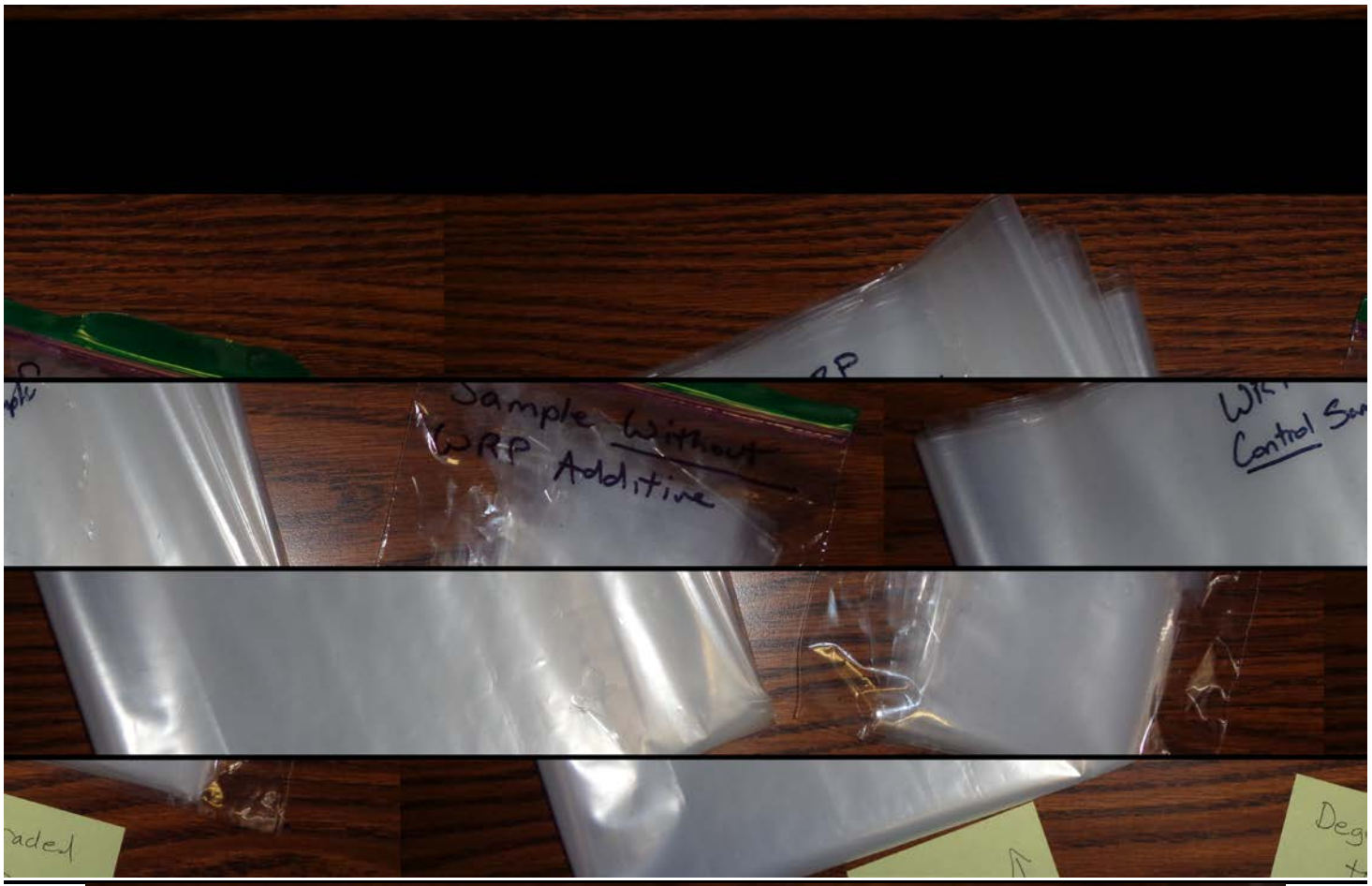
Sample Without
WRP Additive
Control


Sample With
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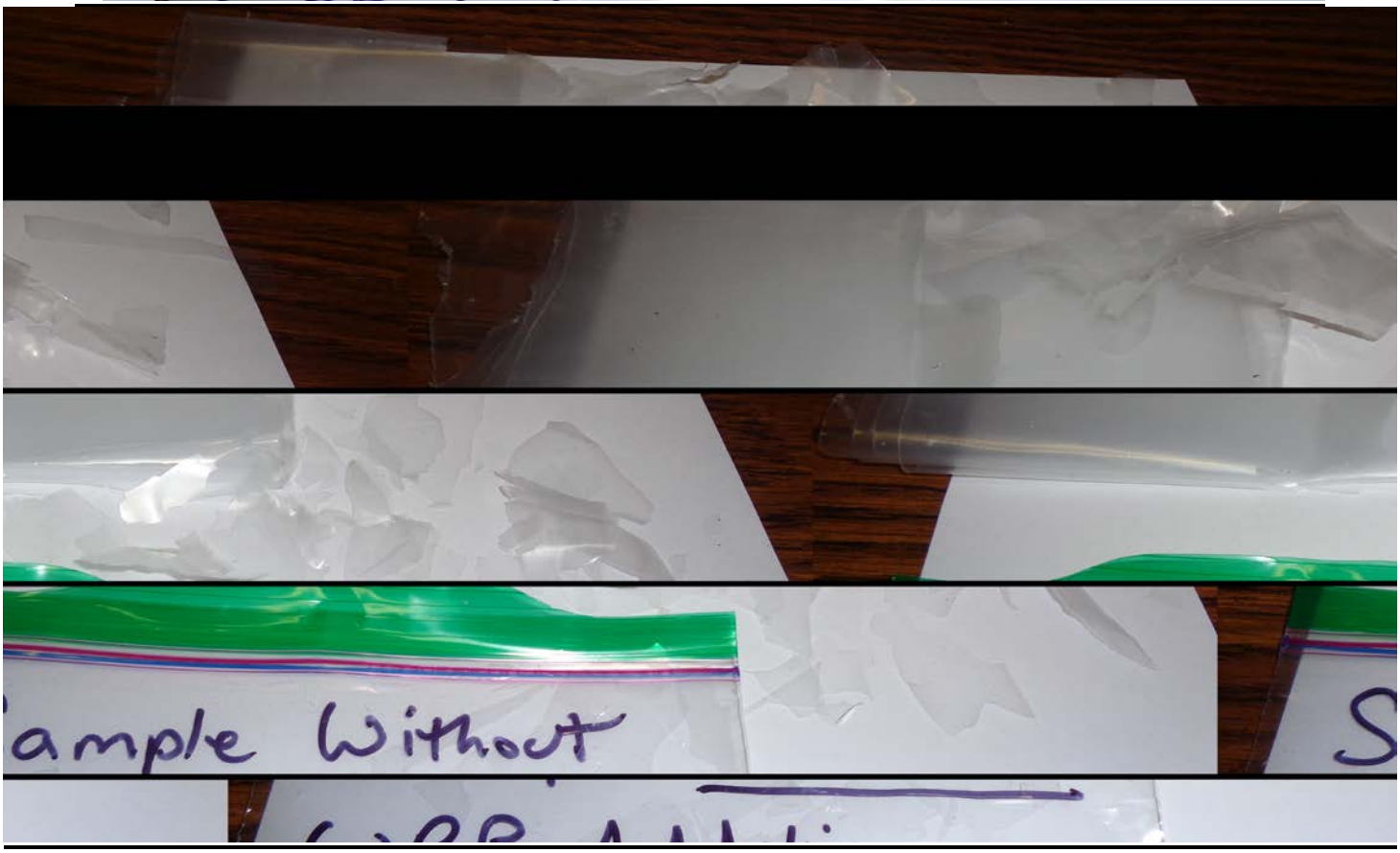
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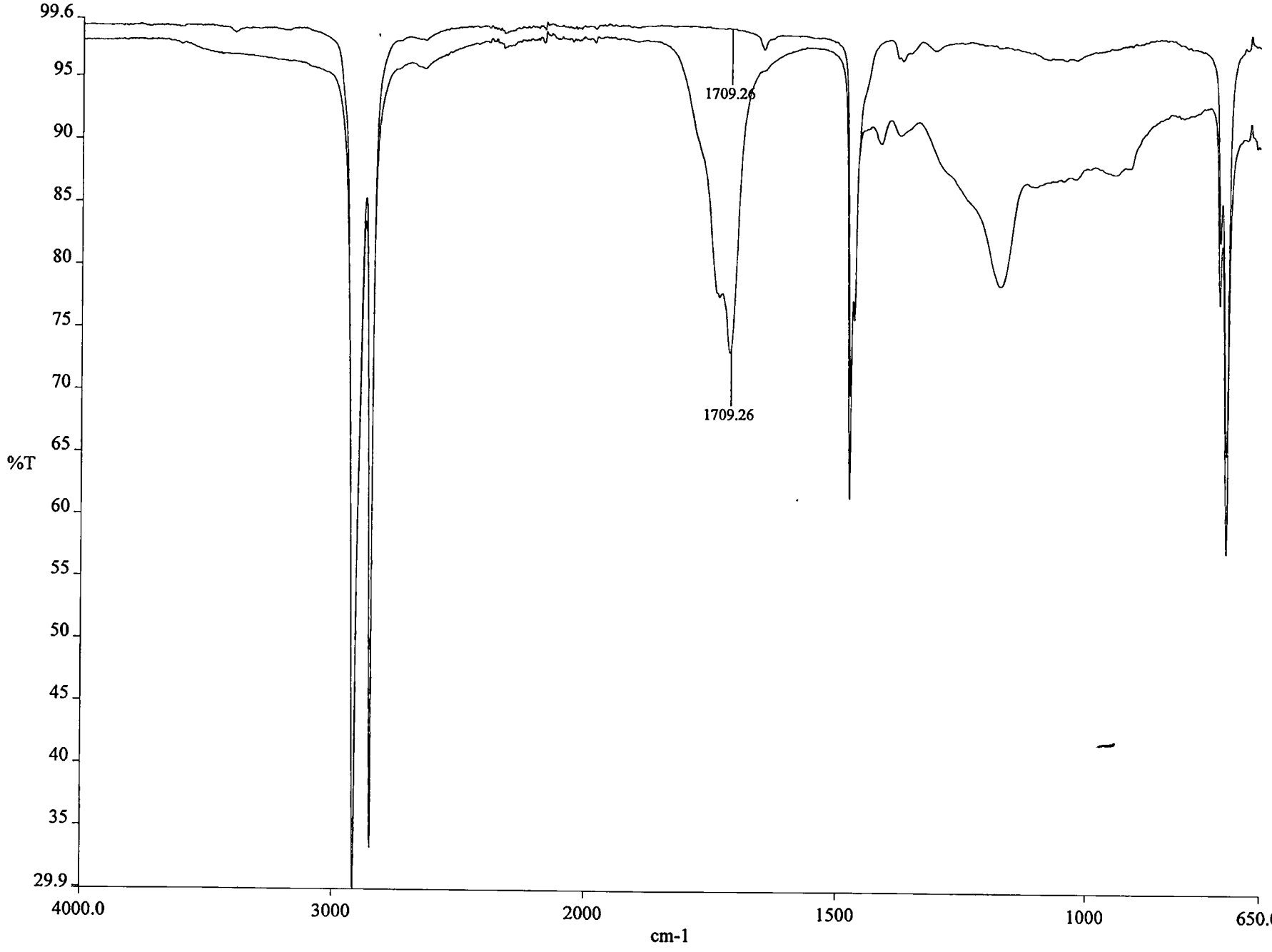
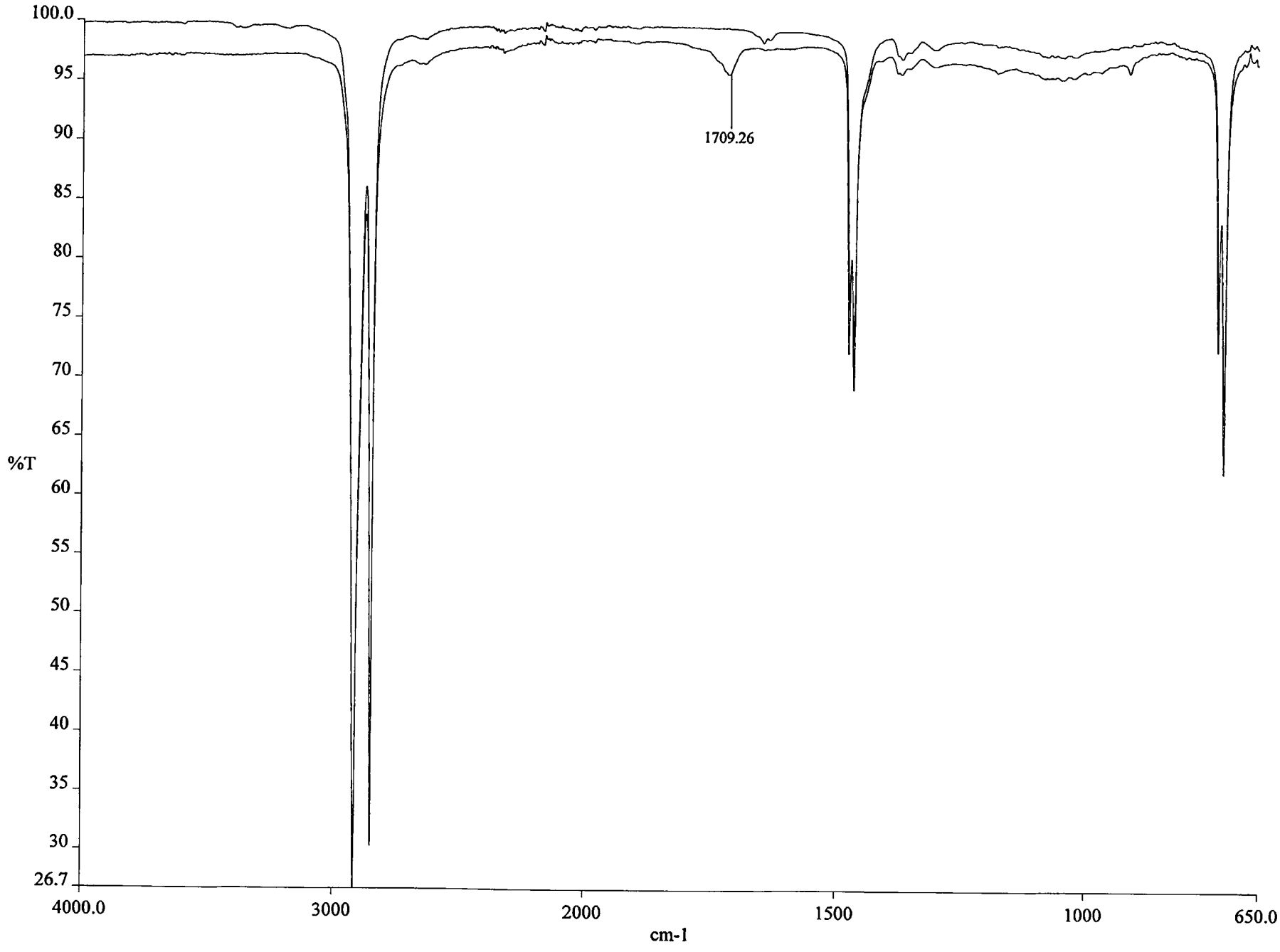


_____ c:\pel_data\spectra\14935b.sp - 19P1031-B, WRP PFQ-M Film - Clear, As received

_____ c:\pel_data\spectra\14935buv.sp - 19P1031-B, WRP PFQ-M Film - Clear, UV exposed to 5% elongation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c:\pel_data\spectra\14935a.sp - 19P1031-A, WRP Control Film - Clear, As received
c:\pel_data\spectra\14935auv.sp - 19P1031-A, WRP Control Film - Clear, UV exposed to 5% elongation

Table I: Tensile results per ASTM D3826 Control film

	Exposure (hours)	Yield		Break	
		Load (psi)	Ext. (%)	Load (psi)	Ext. (%)
Control	168	1974.4	14.99	2091.8	46.00
	192	1761.4	12.54	1824.1	41.92
	216	1512.4	11.23	1745.8	39.51

Table II: Tensile results per ASTM D3826 WRP PDQ-M film with additive

	Exposure (hours)	Yield		Break	
		Load (psi)	Ext. (%)	Load (psi)	Ext. (%)
Sample	168	6.861	6.51	1224.32	8.41
	192	N/A	N/A	724.27	5.87
	216	N/A	N/A	N/A	<5