




Where Do I Start?
How Do I Know I Finished?

Presented by Joseph Dallal, L.C., M.Sc.
 Sr. Mgr. Ashland Specialty Ingredients Technical Sales and Innovation

For **SWS**CC August 21, 2019
 Dallas, Tx

210-380-1326, jdallal@ASHLAND.com
 © ASI 2019



Exercise

- Probie/Newbie/Freshman
- Old Lab Book
- 5 yr. veteran
- Remake old formula
- Probie asks questions
- Learns to fill out lab notebook

© ASI 2019 jdallal@ashland.com 2

What We'll Cover

- What is a Cosmetic Chemist
- Digesting a Project Profile
- Understand the Substrate, End User, the Mode of Application
- Link to a Styling Technique and Tools
- Characterize the Innovation Strategy
 How to Start a Project, Evaluate Stability and Performance, and Scale-Up Tests

© ASI 2019 jdallal@ashland.com 3

Development Chemists

Who are they: What do they do?

- Develop and Use Recipes/Processes/Specs
- Techniques and Technology
- Imagination, Insight, True Science
- Ingredients
- Processing
- Performance
- Scientific Method
- Satisfying Consumer Needs

© ASI 2019 jdallal@ashland.com

4

Ingredients

& Processing

but Creativity

© ASI 2019 jdallal@ashland.com

5

Responsibilities

- Satisfy Marketing Profile
- Performance for the Consumer
- Scale-Up
- Manufacturing
- Performance, Shelf Life, Preservation
- Specs, QC, QA
- Creativity
- Teamwork
- Leadership

© ASI 2019 jdallal@ashland.com

6

Pop Quiz – 5 Min Limit

- Design the BEST
 - Product
 - What is the best Polymer?
 - Design the Formulation and Production Process
 - Specs

© ASI 2019 jdallal@ashland.com

7

The Profile The Brief

- What SKU Category
- Who Will Use It
- How When and Why will they Apply It
- What Kind of Hair
- What Kind of Style
- What Kind of Tools and Technique
- How will it be Applied???? Package??
- **How Much will it Cost?**

© ASI 2019 jdallal@ashland.com

8

Digesting the Profile

- What do you want to CREATE?
- WHO will Use it?
- How will they USE it?
- **What do *they* want it to DO?**
- **How will *they* MEASURE it?**
- **How will YOU Measure it?**
- **What will confirm that YOU were Successful?**

© ASI 2019 jdallal@ashland.com

9

Different Hair or Different Styles?

© ASI 2019 jdallal@ashland.com

10

Product Development Stages

- Ideation/Discovery/Research/Target
 - Marketing Profile
 - Interpretation or Creation
- Formulation/Processing/Implementation
 - Develop and Test or Validate
 - Follow Through, Start to Finish
- Scale-Up Design and Proof
 - 1Kg, 3Kg, Pilot, Small and Final Production
 - Run Stability and Performance Tests

© ASI 2019 jdallal@ashland.com

11

How do you START?

How do you Choose?

• Quo Vadis?

• WIIFM ?

Innovation
 Satisfy End Users
 \$\$Billions



© ASI 2019 jdallal@ashland.com

12

To Start: Understand

- Substrate
- Consumer Using your Product
- Techniques to be Used by Consumer
- Marketing Profile
- Available Technologies
- **Signals?????**
 - What will the Consumer be Looking for?
 - How will You know if you are Successful?

© ASI 2019 jdallal@ashland.com

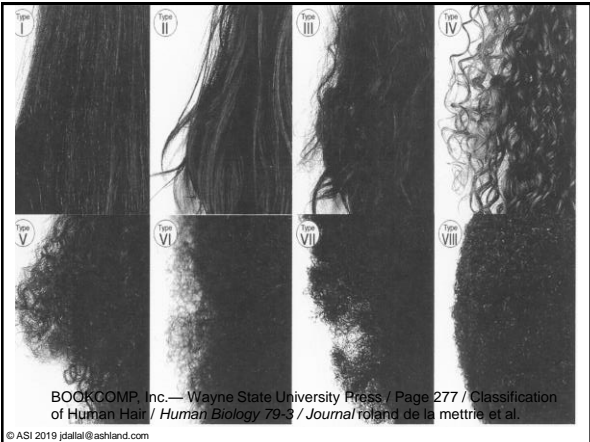
13

What do you make for These Consumers?

Various styles and techniques.
More important than who is wearing them.

© ASI 2019 jdallal@ashland.com

14



© ASI 2019 jdallal@ashland.com

Learn about the Substrate

Moisture is Critical



© ASI 2019 jdalal@ashland.com

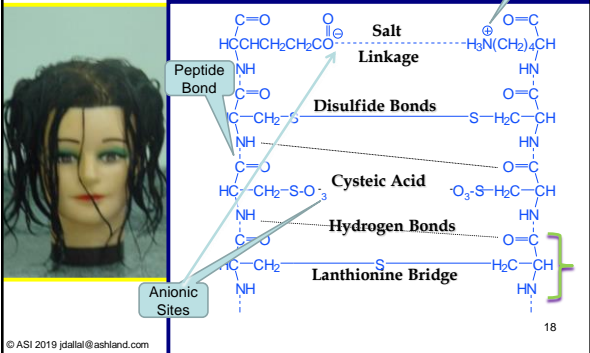
16



© ASI 2019 jdalal@ashland.com

17

What Holds the Hair Together?



© ASI 2019 jdalal@ashland.com

18

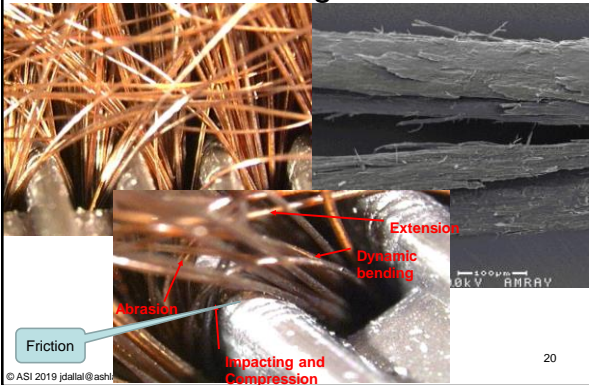
Pre-Detangled Dry Hair



© ASI 2019 jdallal@ashland.com

19

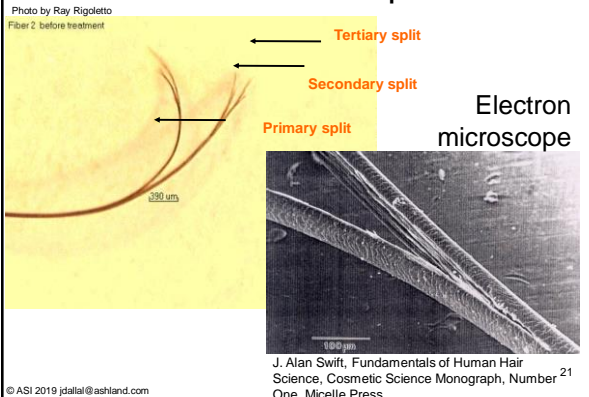
Stress: Damage in Action



© ASI 2019 jdallal@ashland.com

20

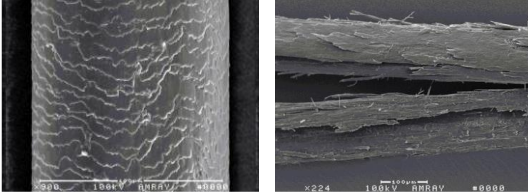
Stereomicroscope



© ASI 2019 jdallal@ashland.com

J. Alan Swift, Fundamentals of Human Hair Science, Cosmetic Science Monograph, Number 21 One, Micelle Press

Surface of Hair



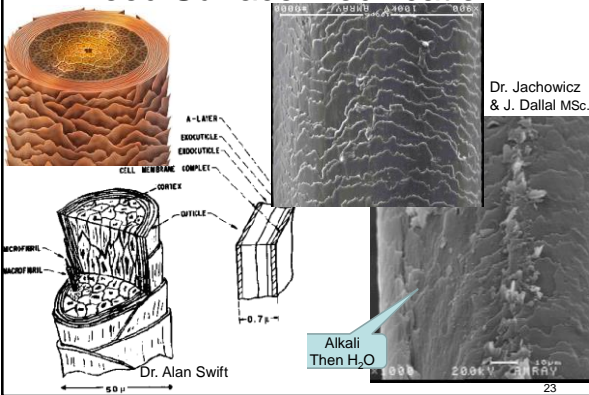
SEM x 900: normal Cuticle

SEM x 225: Cortex exposed, resultant split-end

© ASI 2019 jdallal@ashland.com

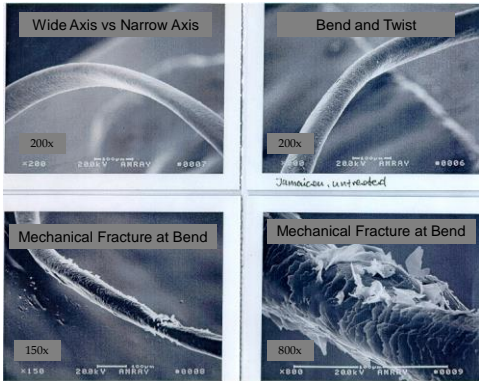
22

Need Surface Modification?



23

Special Features-Needs of Curly Hair



24

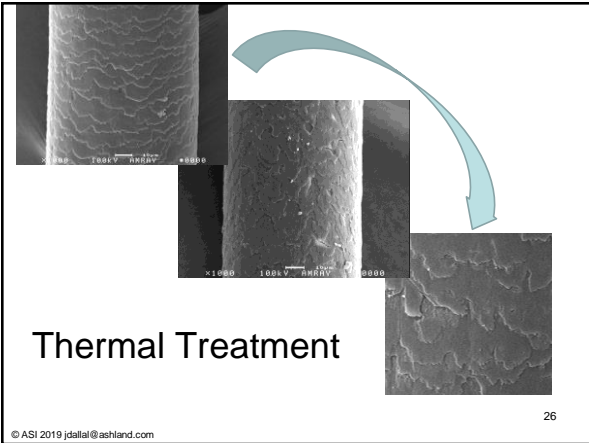
© ASI 2019 jdallal@ashland.com

**Who is your Target?
Why do they
Want your Product?**

**How will they Use it?
What do they Expect?**

© ASI 2019 jdalal@ashland.com

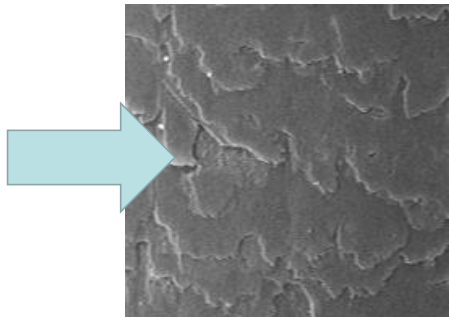
25



© ASI 2019 jdalal@ashland.com

26

Exocuticle Broken Off



© ASI 2019

27



Formulation Innovation Strategy

- Texture
- Application
- Wet Effects
- Drying Down Effects
- Immediate and Long Term After Dry Effects

© ASI 2019 jdalal@ashland.com

Divide Product Development Into 3 Concepts or Guiding Categories

In the Package; Dispensing

- Appearance, Texture, Delivery Method, Spreadability, Stability, PET

On the Hair: Function

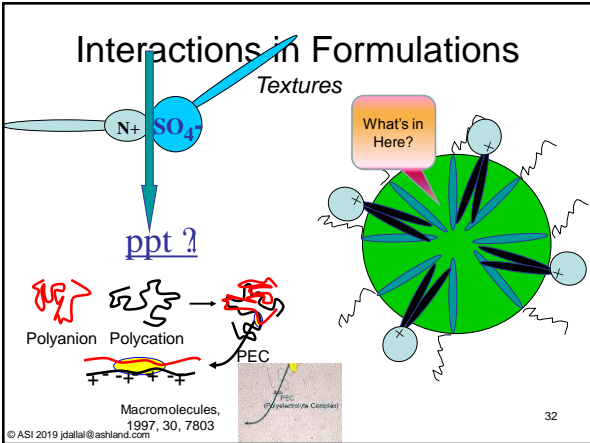
- Wet-Hold, Tack or Grab, Dry Effects, Tackiness, Elasticity, Flexibility, Stiffness, Smoothness, HHCR, Frizz, Static, next day

Scale-Up, Stability, Packaging

© ASI 2019 jdalal@ashland.com

#1 What's it LOOK like?
#2 What's it Do?





Tools to Create Styles

(What's in a name?)
Marketing Terms translate to Formulas

- Liquids, lotions, glazes, gels, spray gels (simple liquids), salt sprays
- Spray gels w/ gel, shaping gels
- Working sprays, curl activators
- Shaping sprays, finishing spray
- Shine and hold, crème gels
- Pomades/Ringing Gels/Pastes/ Putties - anhydrous and emulsions
- A rose is a rose is a ... but is it?

Textures

Mousses

Thermal Protection

Spider Webs

33

Manipulative Techniques

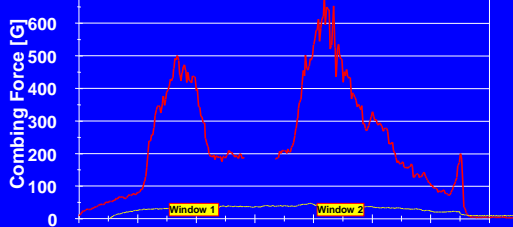
Opportunities

- Wet Sets, Sculpting, Finger waves
- Wet look, Root Lift, Scrunching
- Curling Iron/Marcel/Hot iron/Flat/Ceramic
- Blow drying/diffuser/hot lamps
- curly look/curl activator
- Back Combing/ratting/teasing
- Braiding, pressing, wrapping, polishing

© ASI 2019 jdallal@ashland.com

34

Streaked Hair has Differential Combing: *Equalize It*

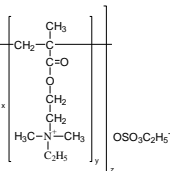
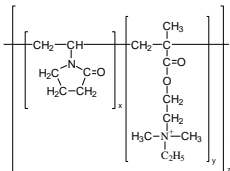
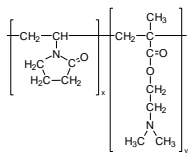
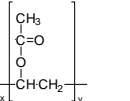
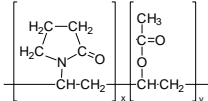
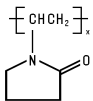


SRGA Jachowicz

— Damaged Hair — after deep conditioner

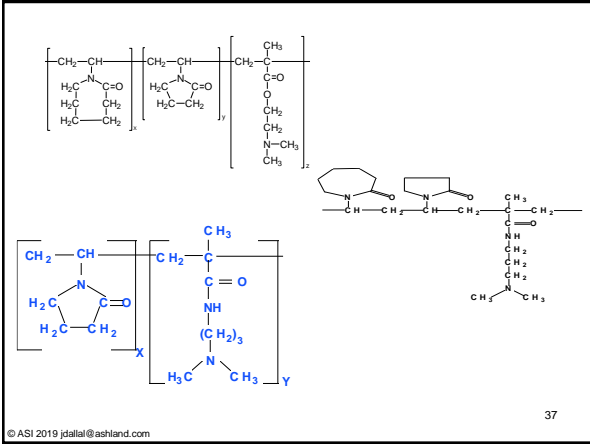
© ASI 2019 jdallal@ashland.com

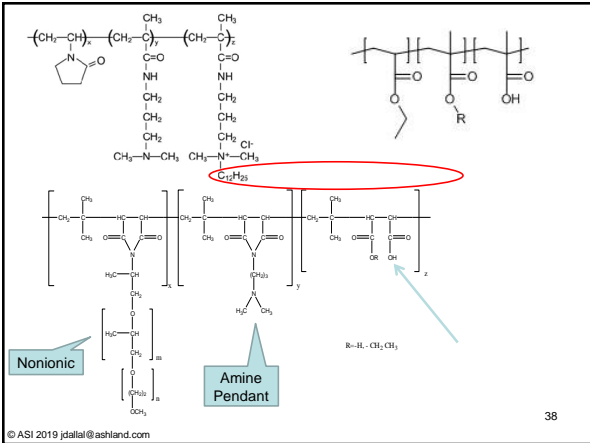
Structure/Property/Function

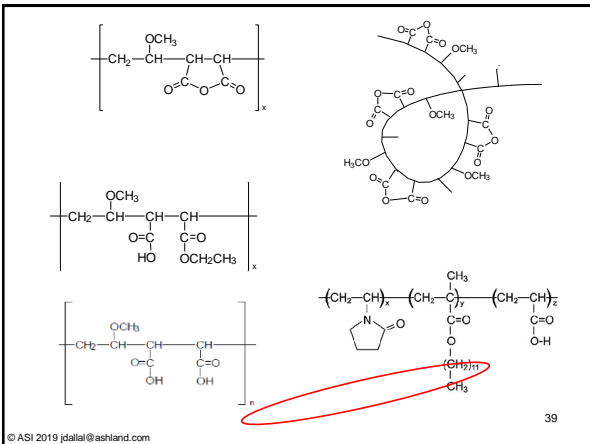


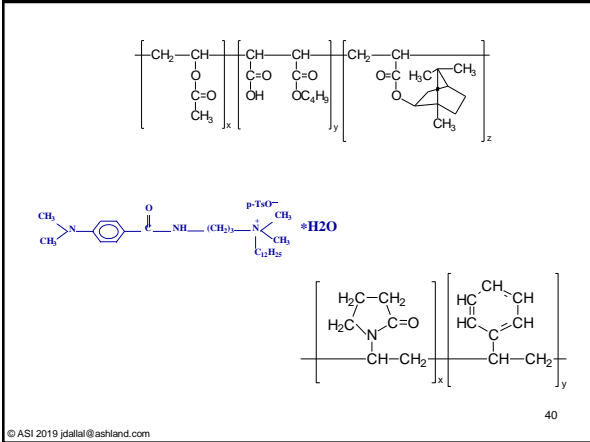
© ASI 2019 jdallal@ashland.com

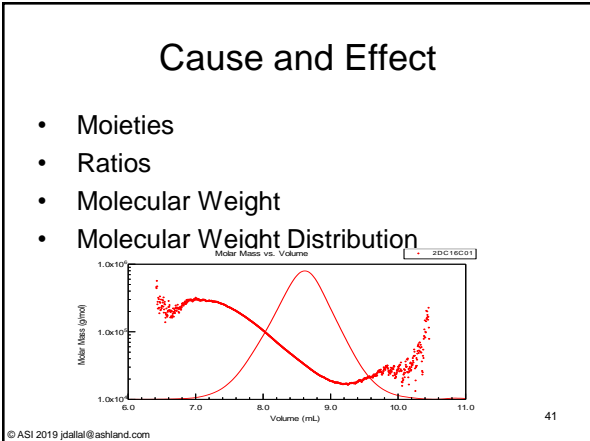
36









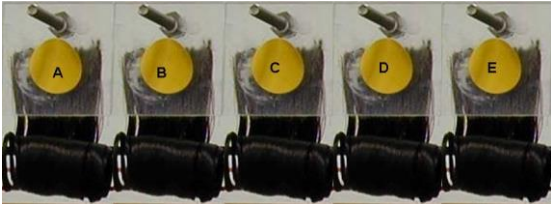


How do you Select?

How do you Choose?

© ASI 2019 jdallal@ashland.com 42

'Wet' Set Swatches



% wt/wt vs Normal use levels vs \$/use

© ASI 2019 jdallal@ashland.com

43

Standardized Hair Tresses



Critical to evaluating styling products on hair tresses

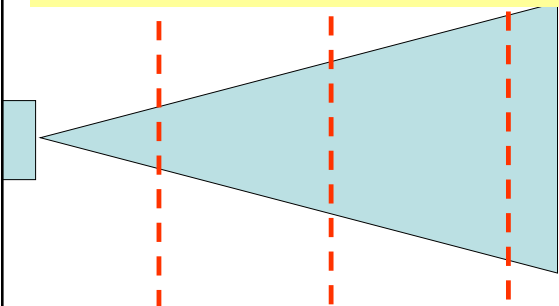
- 1 Same width
- 2 Same length
- 3 Same # hair, or weight
- 4 Same kind of hair, i.e., ...diameter and color or ...condition

These are neither.

© ASI 2019 jdallal@ashland.com

44

Lotion, Gel, or Spray Application



Grams product per square centimeter of hair

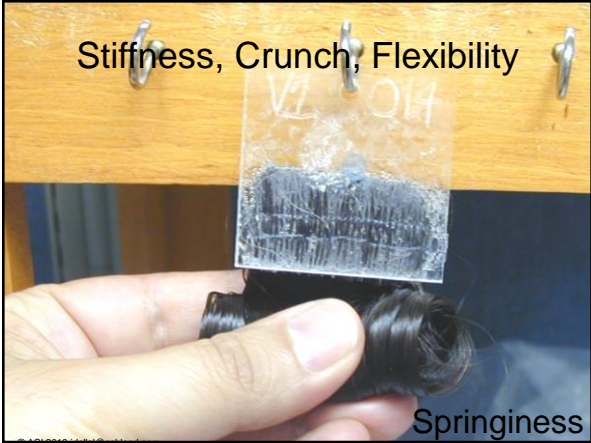
© ASI 2019 jdallal@ashland.com

45

Hair Characteristics



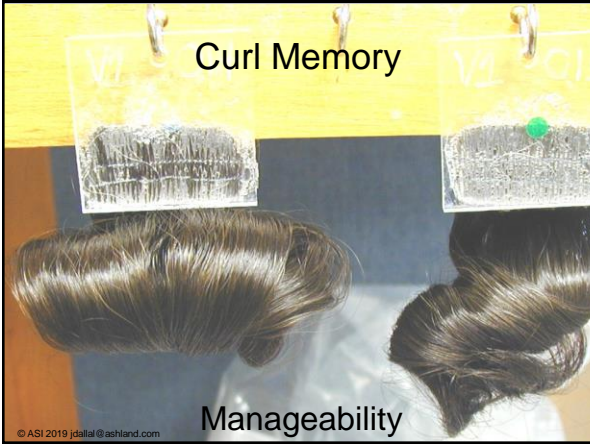
Stiffness, Crunch, Flexibility



Flaking and Residue



On Hair
On Comb



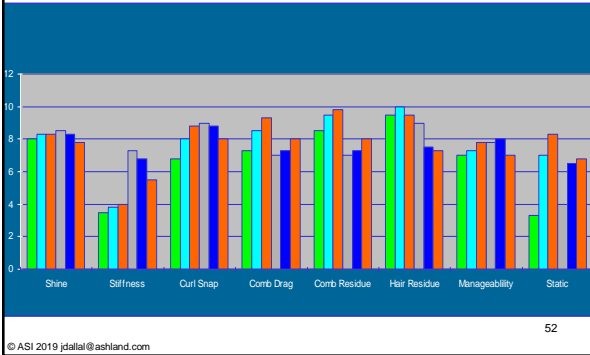


Calibrate and Validate Your Panel

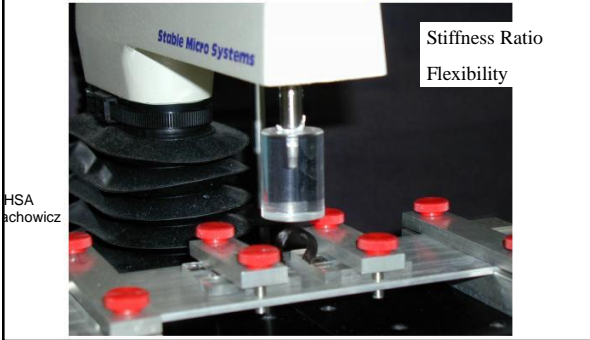
<p>Shine Evaluate visually how shiny the tress is.</p>	<p>10.Very, very shiny 9.Very shiny 8.Shiny 7.Shine to moderate shine 6.Moderate shine 5.Average shine 4.Slight sheen 3.Dull 2.Very dull 1.Very, very dull</p>
<p>Stiffness Compress curl between fingers and evaluate how stiff the curl is.</p>	<p>10.Very, very stiff 9.Very stiff 8.Stiff 7.Stiff to moderately stiff 6.Moderately stiff 5.Slightly soft 4.Moderately soft 3.Soft 2.Very soft 1.Very, very soft (like natural hair)</p>
<p>Curl Snag Hold the top of the tress and place your fingers in the center of the curl and gently pull to full extension, then release.</p>	<p>10.Excellent springback (like a rubber band) 9.Very good springback 8.Good springback 7.Moderate to good springback 6.Moderate springback 5.Fair springback 4.Fair to poor springback 3.Poor springback 2.Very poor springback 1.No springback (completely falls out)</p>

© ASI 2019 jdallal@ashland.com

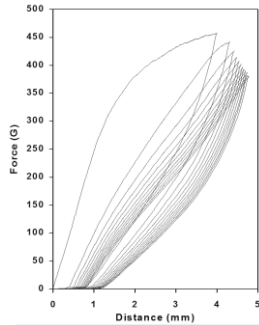
Hair Characteristics



Close-Up View Hair Tress Geometry Below the Texture Analyzer Probe



- > F_1 - maximum force in the 1st deformation
- > F_{10}/F_1 - ratio of maximum forces in the 10th



© ASI 2019 jdallal@ashland.com 54

How do I know if I Finished?

© ASI 2019 jdallal@ashland.com

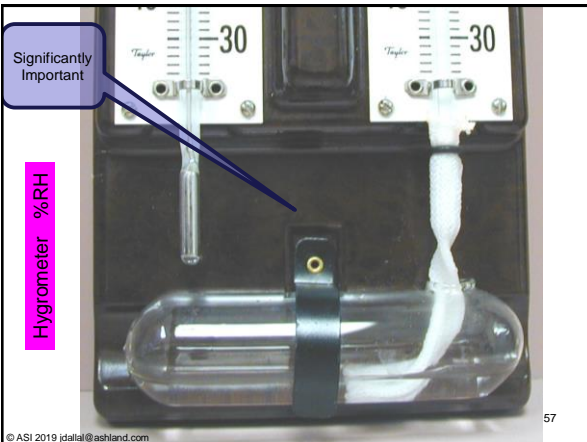
55

Personal Evaluation

- Make Your Own Assessment
- Understand the Scores and Assessments of Others: Panel Tests
- Did it meet all the Profile requirements?

© ASI 2019 jdallal@ashland.com

56



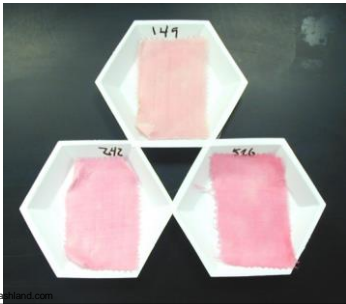
Removability from Hair



© ASI 2019 jdallal@ashia

58

Visualizing Deposit



Employs Negatively Charged dye to show where the cationic molecules remain

© ASI 2019 jdallal@

59

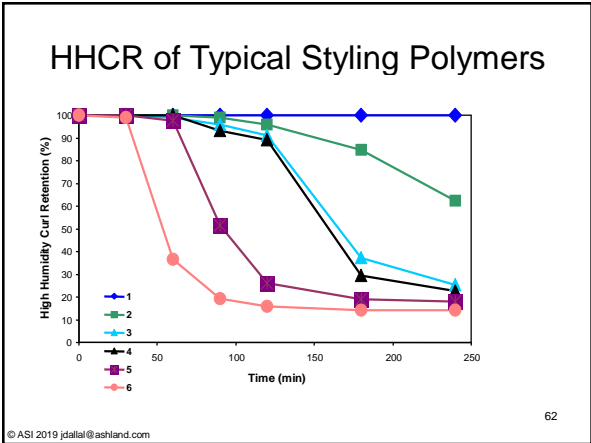
High Humidity Curl Retention

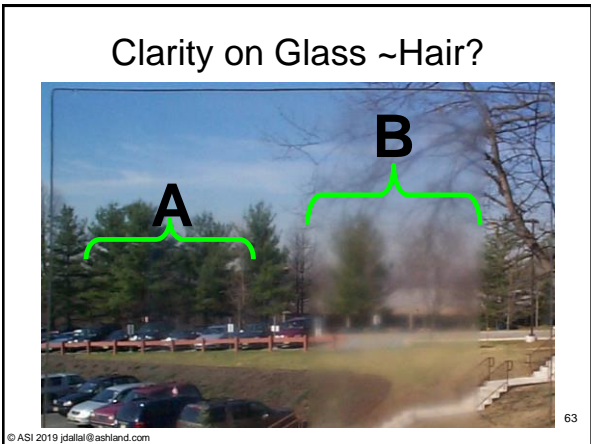


© ASI 2019 jdallal@ashland.com

60



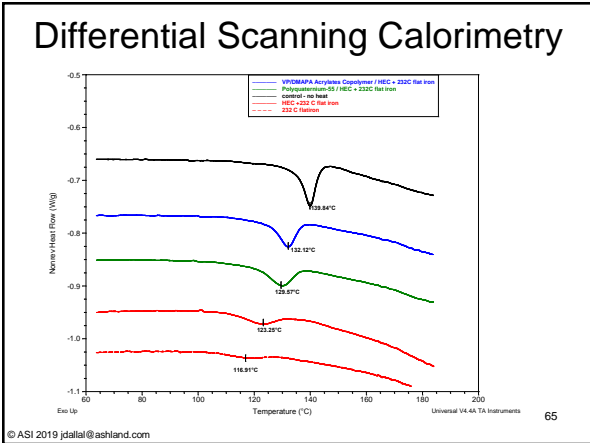


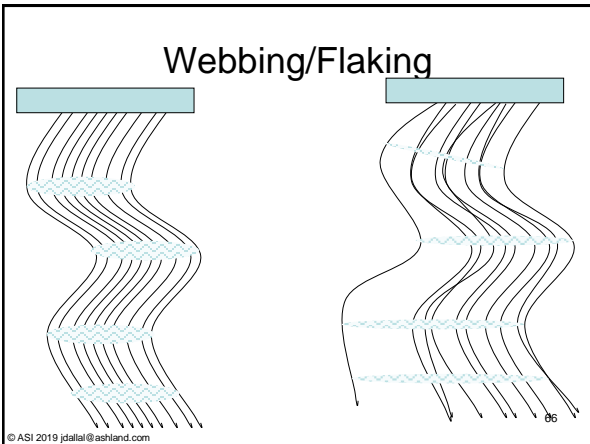


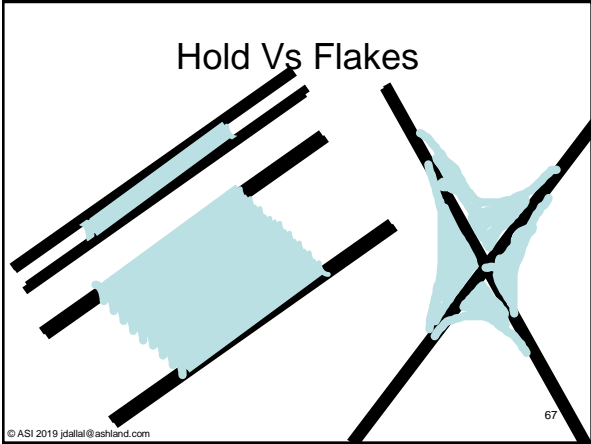
Anti-Breakage Method

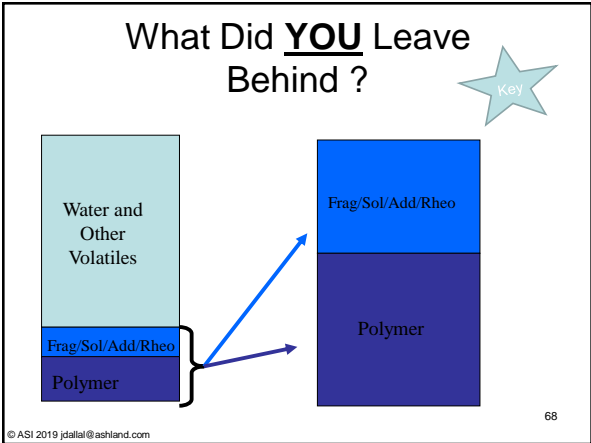
Flat iron regimen Comb tresses Quantify breakage

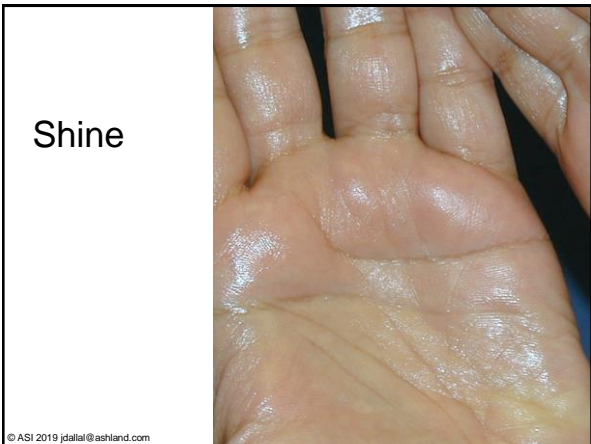
© ASI 2019 jdalal@ashland.com 64

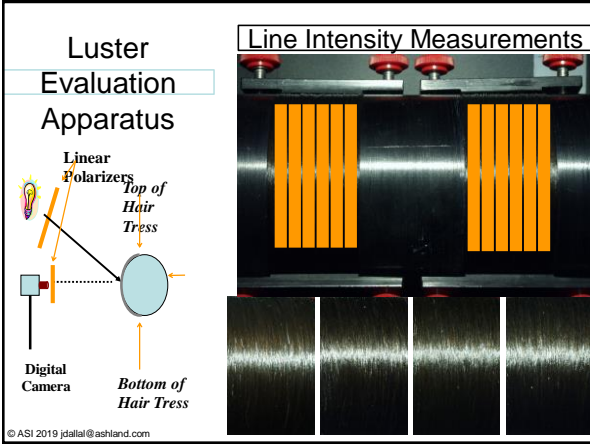




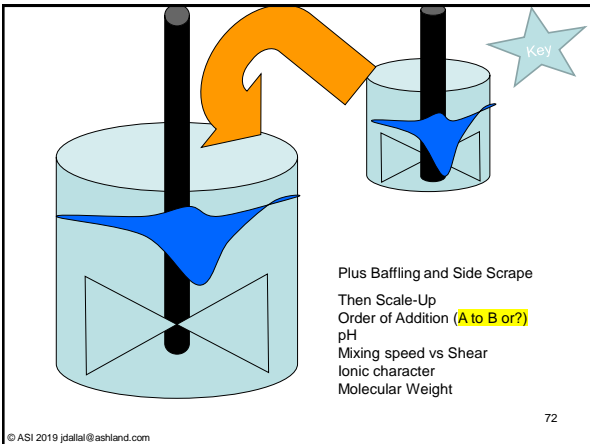












Test Processing Order of Addition



1. Add the Polymer/neutralizer premix solution to the acidic gelling agent slurry.
2. Partially neutralize the gel before adding the polymer. Then complete the neutralization (i.e., add the neutralizer to the polymer solution prior to combining).
3. Neutralize/thicken the gel before adding the polymer powder or solution.
4. Add the polymer to the un-neutralized gelling agent.

© ASI 2019 jdalal@ashland.com

73

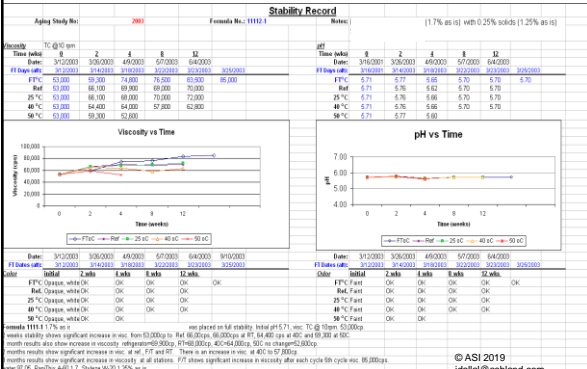
Foam Textures and Looks



© ASI 2019 jdalal@ashland.com

74

Stability Records



Finalize

- Test
- Modify, Adjust, Retest
- Run Stability and Performance (vs Aging)
- Scale-up and Run Stability, Performance
- Test Errors and Limits of Specs *(How to Set?)*

© ASI 2019 jdallal@ashland.com

76

Forced Error Analysis

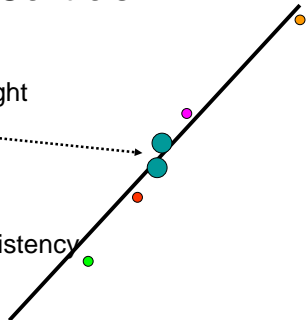
- How robust is the formula?
- Can you identify an Error Visually?
- Salt Curve is an Obvious for Shampoos
- What are the limitations of the Production Environment?
 - Weighed in, Weight by Difference, Pumped in, Metered in?
 - What If?

© ASI 2019 jdallal@ashland.com

77

Controls

- Temperature
- Distance/weight
- Benchmarks
- Bracketing
- Substrate
- Swatch Consistency



© ASI 2019 jdallal@ashland.com

78

Starting a Project Evaluation of Profile: First

- What kind of package and dispenser will deliver the product to the consumer?
- How much product they will use in one application?
- Will they apply the product to wet or dry hair
- How they will disperse the product onto or throughout the hair or parts of the head of hair?
- How they will dry it?
- What will the hair look like after it is done?
- How long does it need to last (maintain the desired look), either FIXed in place or FREE flowing?

© ASI 2019 jdallal@ashland.com

79

Strategies

- Choose a Matrix to Deliver the Actives
 - Commensurate to the Package, HairStyle and Styling Technique
- Choose the Active Polymer and Modifiers to Deliver
 - Feel Characteristics
 - Holding Power
- Adjust Levels to Optimize, Test Performance on **Hair**
- Run Scale-Up Studies, Stability, Efficacy

© ASI 2019 jdallal@ashland.com

80

It's the Formula that Performs

- It's a Concert of ACTION
- Not an Individual Ingredient
- Not the Package
- It's What **YOU** Created...

© ASI 2019 jdallal@ashland.com

81

Make and Evaluate

- Remember Mistakes as well as Successes
- Everything is GOOD Eventually

References

- Harry's Cosmeticology (Marty Reiger)
- Hair and Hair Care (Dale Johnson)
- Chemical and Physical Behavior of Hair (Clarence Robbins)
- Maison G. De Navarre
- Spray, C&T, HAPPI, etc
- American Salon, PBA, Modern Salon
- BTC.com, etc. etc. etc. YouTubes

Thank You to my Mentors and Influencers

Develop relationships with multi-mentors

Thank You

- Enjoy Designing, Creating, Making, Testing, and Improving
- Nurture Several Mentors
- ***Raise the Bar*** ***Pay it Forward***

Joseph A. Dallal, L.C., M.Sc. jdallal@ashland.com 210-380-1326
© ASI 2019

85

What Would you make for me?

© ASI 2019 jdallal@ashland.com

86

disclaimer

The information contained in this presentation and the various products described are intended for use only by persons having technical skill and at their own discretion and risk after they have performed necessary technical investigations, tests and evaluations of the products and their uses. This material is for informational purposes only and does not constitute scientific support for the use of the products described herein as an ingredient in cosmetic products intended to enhance appearance and other cosmetic benefits or to enhance performance of oral and dental. Certain end uses of these products may be regulated pursuant to rules governing medical devices or other regulations governing drug uses. It is the purchaser's responsibility to determine the applicability of such regulations to its products. While the information herein is believed to be reliable, we do not guarantee its accuracy and a purchaser must make its own determination of a product's suitability for purchaser's use, for the protection of the environment, and for the health and safety of its employees and the purchasers of its products.

Neither Ashland nor its affiliates shall be responsible for the use of this information, or of any product, method, formulation, or apparatus described in this brochure. Nothing herein waives any of Ashland's or its affiliates' conditions of sale, and no statement, information and data is to be taken as a guarantee, an express warranty, or an implied warranty of merchantability or fitness for a particular purpose, or representation, express or implied, for which Ashland and its affiliates assume legal responsibility. We also make no warranty against infringement of any patents by reason of purchaser's use of any information, product, method or apparatus described in this presentation.

The testing information (the "Testing Information") has been gratuitously provided by Ashland. The Testing Information is based on many factors beyond Ashland's control, including but not limited to, the conditions prevailing when the testing was conducted, and in some cases, is based on data generated with development samples of the Active Ingredient. Although it is intended to be accurate, ASHLAND DISCLAIMS ANY AND ALL LIABILITY, EITHER EXPRESS OR IMPLIED. The Testing Information is confidential or proprietary to Ashland, and may not, except as provided below, be disclosed to any third party. You may not reuse commercial use of the Testing Information, or make claims with respect to your products based the Testing Information, without the written agreement with Ashland covering such use.

© Registered trademark, Ashland or its subsidiaries, registered in various countries
 ™ Trademark, Ashland or its subsidiaries, registered in various countries
 * Trademark, owned by a third party
 © 2019, Ashland

87