

Stickies:

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Stickies

A sticky particle:

- is typically hydrophobic
- is **tacky and depositable**
- often **DEPOSITS ON EQUIPMENT**
- Often adsorbs particulates/dissolved species

- Examples of adsorbed species might include talc, Calcium Carbonate, Inks, Toners, polymers ...

What are stickies?

Stickies in paper recycling are believed to be a mixture of

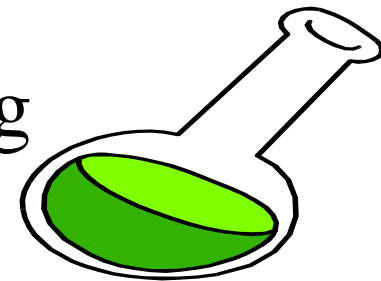
----Hot melts adhesives

----Pressure-sensitive adhesives (PSA's)

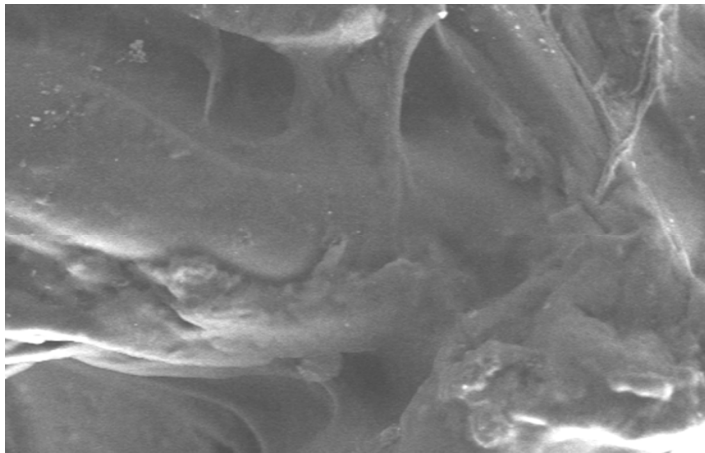
----Wax

----Inks, Paper additives, Coating

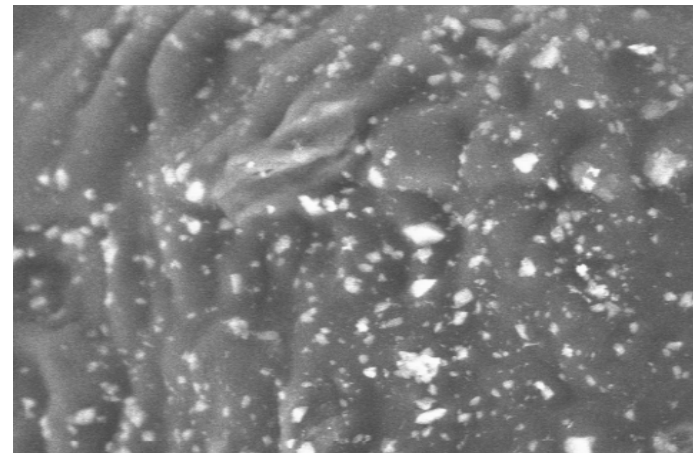
----Wood derived extractives...



*The actual surface behavior of stickies depends on the adsorbed species.



PSA Surface



PSA Surface with CaCO₃

Composition of Hot Melts

- **Vinyl Acetate Polymers and Copolymers**
- **Tackifiers**
- **Wax**

Properties of Hot Melts

- **100 Percent Solid Formulations**
- **Softens at 150°F to 250°F**
- **Insoluble in Aqueous Media**
- **Soluble in Many Organic Solvents**
- **Density 0.9 to 1.0 g/cc**

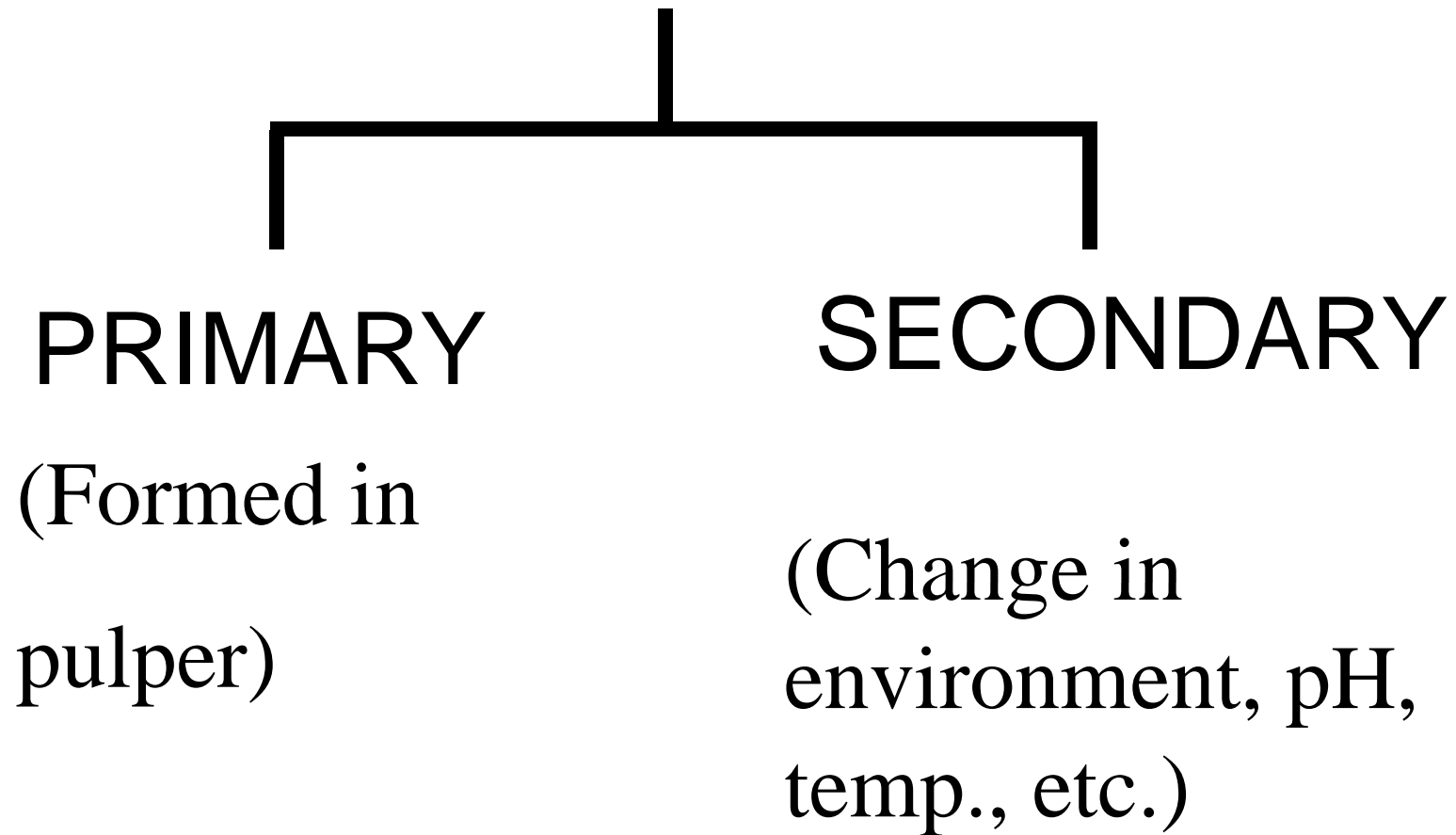
Composition of PSA

- **Rubber Elastomer**
(e.g. **Styrene-butadiene or poly acrylate**)
- **Tackifier**
- **Fillers (MgO. ZnO, etc.)**

Properties of PSA

- **Insoluble in Aqueous Media**
- **Soluble in Many Organic Solvents**
- **Density 0.9 to 1.1 g/cc**

CLASSIFICATION OF STICKIES



MACRO VS MICRO STICKIES



Macrostickies

Retained on 6-cut
(0.15 mm) slotted
screen*

Microstickies

Accepted by 6-cut
(0.15 mm) slotted
screen*

Stickies-Related Problems

- Product quality
 - Dirty spots in paper
 - Holes
 - Converting issues
- Operational problem
 - Deposition on machine
 - Breaking web
 - Down time for cleaning

Control and Removal Methods for Stickies

- Use of environmentally benign adhesive (recyclable adhesive)
- Avoidance: Control of recovered paper quality
- Mechanical removal: screening and water clarification
- Chemical control: polymers surfactants, others
- Passivation with inorganics
- Enzyme hydrolysis
- Physical adsorption to paper fibers: retention
- Dispersion
- Protection: treatment of equipment to limit deposits
- Mill shut down for clean-up