

APPLICATION NOTES

June 2008

Introduction

Rodelene is a haze-inhibiting polishing additive specifically formulated to help limit the time required for haze removal during the polishing process of silicon and other II-IV and III-V materials. Rodelene also works to prevent the reformation of haze during subsequent storage and handling procedures.

- Rodelene can be used to reduce haze during polishing by addition to the final slurry. It is most effective if used at the end of the final polish cycle. Rodelene should not be used during stock removal since it significantly inhibits removal rates; however, it can be used after the stock cycle to stop the chemical activity of the slurry.
- Rodelene is effective in the prevention of haze formation after polishing if wafers are stored in a solution of Rodelene and deionized water.
- Experiments have shown Rodelene to be an effective deoxidizing agent when used on aluminum memory disks or read-write heads for the removal of the oxide films caused by Al₂O₃.

Rodelene Haze Suppressant is available in two forms: **Concentrate**, a highly concentrated dispersion, and **Premix**, a partial dilution for easier handling.

The information provided in this note should be used as a starting point for the customers' application.

Use

Rodelene Concentrate must be pre-diluted before use. To make primary dilution, mix one part Concentrate with 50 parts deionized water using a low shear propeller type mixer. **DO NOT POUR RODELENE INTO STILL WATER.** Mixing should continue for at least 30 minutes until the mixture is completely dissolved. The mixture should then be allowed to age at least 12 hours before using.

Rodelene Premix is ready for immediate use. It has already been diluted, so its concentration of active ingredients is equivalent to a 50:1 dilution of Concentrate. Either the Premix or the primary dilution of the Concentrate can be used in the applications below.

Quench Stream Application: Mix one part Premix or one part of the primary dilution of Concentrate (see above directions for dilution) and use in the following ways:

- During the last two minutes of the polishing cycle, add the **Rodelene** as a separate stream.
- Stop slurry flow and begin rinse cycle. Continue **Rodelene** flow throughout rinse.
- In an operation where the wafers must sit on the polishing pad while the carrier unloading cycle is performed, add the **Rodelene** solution during the

last 15-30 seconds of rinse to prevent most wafer surface defects caused by the chemical activity of the stock polish slurry.

Final Slurry Additive: Add Premix or primary dilution of Concentrate (see above directions for dilution) to deionized water prior to colloidal silica addition. A quantity sufficient to yield a final concentration of one part **Rodelene** solution to 50-60 parts of final solution should be used.

Wafer Storage Solution: Use one part of Premix or primary dilution of Concentrate (see above directions for dilution) to 100 parts of deionized water.

All traces of **Rodelene** can easily be flushed away with deionized water. Oxidizing acids will speed the process.

Standard packaging includes five (5) gallon pails and fifty-five (55) gallon drums. One (1) gallon bottles are also available upon request. All containers are High Density Polyethylene (HDPE). Maintain storage in a temperature-controlled environment, between 40 and 100°F, avoiding prolonged exposure at either extreme.

Rodelene is completely biodegradable and, where regulations permit, may be safely flushed into sewer systems. No special disposal precautions are necessary. **Rodelene** contains no metallic ions. However, to avoid skin or eye irritation, handlers should use personal protective equipment including; rubber gloves, protective clothing, and eye protection. Follow all MSDS and label precautions and use appropriate industrial safety and hygiene practices when handling or using this product.

Shelf Life

Natural biological activity and oxidation reduce the concentration of the active agents in **Rodelene** in water. The following are recommended shelf-life limitations for **Rodelene** solutions:

- **Rodelene Premix:** 12 month
- **Rodelene Concentrate:** 12 months
- Primary dilution of Concentrate: 2 weeks
- Final dilution of Premix or Concentrate: 72 hours

Other Notes

- The most consistent haze-free results are obtained if the final polishing temperature (end of cycle) remains below 108° (42°C).
- If pad squeaks on stopping, increase the concentration of **Rodelene**.
- Slurry must be present for **Rodelene** to provide effective haze removal. However, to get best surface, **Rodelene** should be dripped directly onto the polishing pad as a separate stream. Both excessive and inadequate end of cycle rinsing must be avoided. Over-rinsing can cause the silicates deposited in the pad to be drawn out, resulting in haze from the alkaline exposure. Under-rinsing can leave excess slurry on the wafer which can generate an alkaline etch-related haze.

- **Rodelene** greatly enlarges the window between excessive and inadequate rinsing and helps eliminate variation caused by the reservoir capacity of the pad by masking the wafer surface from the etching effect of the slurry.

If you have any questions or comments, please don't hesitate to call your EMINESS Technologies, Inc. Applications Engineer.